MAR 2 6 1928

Another Step of Progress Has Been Taken toward Realization of the A. Ph. A. Headquarters—a Most Desirable Site for the Building Has Been Secured by Purchase.
Prepare for "Convention Week" in Portland, Maine—the Week of August 20th.

Vol. XVII, No. 3 MARCH, 1928

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE SEVENTY-SIXTH ANNUAL CONVENTION WILL BE HELD AT PORTLAND, ME., DURING WEEK OF AUGUST 20, 1928.

The 1928 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries will also be held at Portland, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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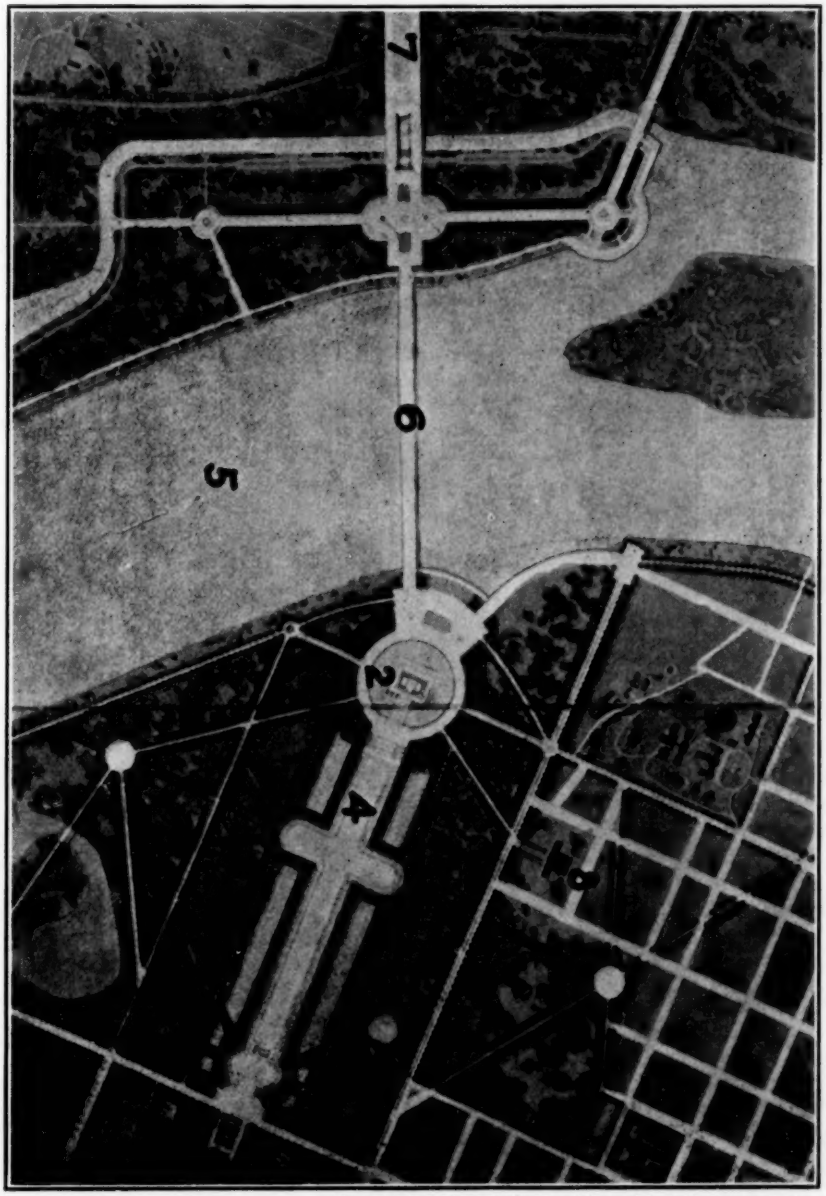
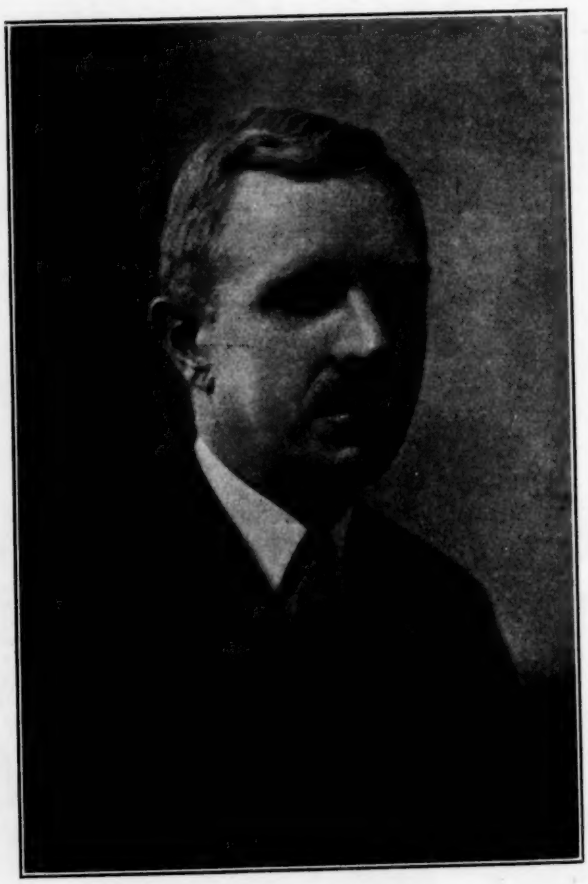


From Report of the Arlington Memorial Bridge Commission

Fig. 1.—Pharmacy Headquarters Site. The other figures indicate some of the outstanding structures of this section visible from the Pharmacy Site as follows: 2, Lincoln Memorial; 3, Washington Monument; 4, Mirror Lake; 5, Potomac River; 6, Arlington Memorial Bridge; 7, Main Entrance to Arlington National Cemetery; 8, National Academy of Sciences; 9, Naval Hospital Grounds and probable site of new U. S. Public Health Building; 10, Pan-American Building.



SEWALL CUTLER.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVII MARCH, 1928 No. 3

SEWALL CUTLER.

Sewall Cutler, President of the National Wholesale Druggists' Association, was born in Brookline, Mass., June 11, 1881. Here he received his early education; later, he matriculated at Harvard College and was graduated with the class of 1903 as a Bachelor of Arts.

Shortly after graduation Mr. Cutler engaged with the Eastern Drug Company, Boston, in which, during the progress of years, his work has covered all the departments of the business; he has been a director of the Company for a number of years and is now its Secretary.

In 1915 Mr. Cutler enlisted in the officers' training camp at Plattsburg, N. Y. When the United States entered the World War, he went into the service and was assigned to the Aviation Division. Having won his wings, he was sent to Washington, with the commission of first lieutenant, to examine candidates for the air force. He served in this capacity from January to June 1918, when he went to France for training in the chemical warfare service. As an officer in the first gas regiment, he saw service at the front until the armistice was declared. After the close of the war he returned to the Eastern Drug Company.

President Cutler has been active in the affairs of the National Wholesale Druggists' Association for a number of years; as Vice-President, 1919–1920, and member of the Board of Control since 1921. He has been President of the New England Drug Exchange and is a member of the Executive Committee of the Druggists' Supply Corporation. His views on organized efforts are quoted from a New Year's message to the members of the N. W. D. A.:

"We should recognize that collective effort may accomplish much where individual effort fails. Collective effort never meets its greatest success unless every individual in the collection or organization does his part.

"We should ascertain all facts involved and utilize every legal means in our possession to protect the retail druggist in his competition with those outside interests which are encroaching on the fields of his activity in a way that is injurious and detrimental to the progress of fair trade practice."

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

SITE FOR THE PHARMACY HEADQUARTERS BUILDING IN WASHINGTON.

ANOTHER forward step has been taken toward the completion of the Pharmacy Headquarters Building in which every drug interest in the country has taken a very active part and to which approximately 15,000 retailers, wholesalers, manufacturers, teachers, writers, publishers, students and others, have subscribed more than $700,000.

The Committee on Site, of which H. A. B. Dunning is the Chairman, has carefully studied the situation in Washington with the helpful advice of a number of able realtors and is especially indebted to the District of Columbia Planning Commission and its executive officer Major Carey Brown for valuable assistance. Realizing the importance of the proper location of the Building in the Capital City, the Committee has investigated every suggested site, of which a large number were submitted. It has kept in mind that the usefulness of the Building is of greatest importance and the desirability of locating it so that those who see it will be impressed. It was soon decided that the most desirable location available was that between Twenty-Second and Twenty-Third Streets and facing the Mall, and the Committee recommended to the Council of the A. PH. A. that it be purchased.

The site is directly opposite the Lincoln Memorial and in view of the Washington Monument and the Arlington Memorial Bridge, now being erected to connect the Mall with the Arlington Estate, across the Potomac River. It is situated between the National Academy of Sciences and the grounds of the Naval Hospital and because of its elevation commands a wonderful and unobstructed outlook over the Mall and the Potomac River, to the hills of Virginia beyond. The Government is planning to erect the Headquarters of the Public Health Service on that part of the Naval Hospital property facing the Mall, which will locate the Pharmacy Headquarters Building between this imposing structure and the beautiful building of the National Academy of Sciences.

The Council of the A. PH. A. adopted the recommendation of the Committee on Site and the purchase of the property was completed on February 29th. It is no exaggeration to state that no more suitable or imposing site for the Pharmacy Headquarters Building could have been selected. It will be so situated that nothing can later interfere with the view which the location commands, and the developments which the Government is making in that section of the Mall insure that the surroundings will become more beautiful and imposing as time goes on.

The Campaign Committee felt that the funds in hand should be reserved for the erection of the Building and therefore an effort has been made to secure special subscriptions for the site. Its purchase has been made possible by the generous interest of Messrs. H. A. B. Dunning, A. R. L. Dohme, J. W. Westcott, G. A. Pfeiffer, J. K. Lilly and Henry S. Wellcome and further assistance to this end from others is expected.

Now that the site has been obtained the Committee on Plans will proceed with its work and, as soon as the general requirements and arrangements are determined upon, an architect will be selected with the purpose of completing the Building as soon as practicable. In developing the plans and in designing and erecting the Building, the ASSOCIATION will work in close coöperation with the Fine Arts Commission of the Government, which has supervision over the erection of buildings that face on public property in Washington, and it may confidently be expected that the final result will be in keeping with its really wonderful surroundings and a credit to Pharmacy and to those who have made its erection possible. E. F. K.

THE PHARMACIST AND PUBLIC HEALTH.

PUBLIC Health matters concern every individual and it is an opportunity as well as the duty of pharmacists to coöperate with public health agencies, in disseminating reliable information concerning public health; they are qualified to render a distinct service because of the strategic position and contact with the public. It needs no comment to stress the importance of such service and that this has part in the professional status of pharmacists. It is because pharmacy is an essential part of medical service that pharmacists have recognition in the Bill now in Congress, whereby it is sought to coördinate the public health activities of the Government. Hearings on the Bill have been held (see January JOURNAL A. PH. A. p. 92) and the measure has made progress by a favorable report, on February 21st, of the House Committee on Interstate and Foreign Commerce; the *Weekly Review* of the Chamber of Commerce, U. S. A. reports as follows:

"The Bill would authorize the detail of personnel of the Public Health Service to other departments and independent establishments of the Government, would allow the detail of such personnel to educational and research institutions for the purpose of conducting special studies on scientific problems relating to public health, and provide for the creation of new units in the Hygienic Laboratory. It would also place professional commissioned personnel—dentists, sanitary engineers, pharmacists, etc., on an equal footing as to appointment, pay, promotion, disability privileges, etc.—with medical officers of the regular army. The head of the public health service would be raised to the rank of major general (an increase in salary of $2200). Specialists in scientific research could also be secured in cases of extreme need through initial appointment to grades higher than that of assistant surgeon—a limitation at present in the law. There are other administrative changes proposed dealing with promotions, numerical limitations affecting the various commissioned grades, etc."

The following is reprinted from the report of the Hearing on the Public Health Bill (H. R. 11026). The House passed the measure on March 7th.

Those representing pharmacy requested that the Bill be so amended as to provide that pharmacists of the Public Health Service shall be eligible to receive commissions, after examination, in the same manner as provided for medical and dental officers, for sanitary engineers and for other scientists. The representatives of pharmacy were very pleased by Surgeon-General Cumming's approval of this request, and they were encouraged to believe that this very fitting recognition of pharmacy would be incorporated in the final legislation. If so, the Parker Bill should then have the united and strong support of pharmacists not only because of the recogni-

tion of pharmacy but also because this legislation will open the way for the proper solution of the long standing question of the status of all pharmacists in the Government service.

Quotations follow from H. R. 11026, Section 2 (*b*), Section 4 (*a*) 1 and 2 and (*b*):

(*b*) The Secretary of the Treasury is authorized to establish such additional divisions in the Hygienic Laboratory as he deems necessary to provide agencies for the solution of public-health problems, and facilities for the coördination of research by public health and pharmaceutical officials and scientists and for demonstrations of sanitary methods and appliances.

Sec. 4 (*a*) Hereafter sanitary engineers, medical, dental and other scientific officers, including pharmacists engaged on comparable duties, of the Public Health Service, selected for general service and subject to change of station, shall be appointed by the President, by and with the advice and consent of the Senate, subject to the same conditions and limitations as commissioned medical officers of the regular corps of the Public Health Service, except that—

(1) Examinations shall be in the several branches of the profession of the person to be appointed;

(2) Any sanitary engineer, medical, dental or other scientific officer, or pharmacist engaged on comparable duties, in the Public Health Service upon the date of passage of this Act, except commissioned officers of the regular corps after examination by a board of officers convened by the Surgeon-General of the Public Health Service and upon the recommendation of such board and the Surgeon-General, may be appointed to any grade specified by such board and approved by the Surgeon-General, having due regard to the salary received by such officer at the time of such appointment; and in computing longevity pay and pay period the service of any officer appointed under the provisions of this paragraph who was in the Public Health Service on June 30, 1922, shall be counted in the same manner as provided for regular commissioned officers in the Public Health Service on that date;***

(*b*) The Surgeon General of the Public Health Service shall designate the grades of commissioned officers of the Public Health Service other than medical officers, corresponding to the grades of medical officers.

We are hopeful that this is a step in pharmaceutical progress and constitutes a rightful recognition of pharmacists which has long been sought for and will redound to the benefit of the Service.

Pharmacy and Merchandising are not incompatible; an analysis will reveal that no profession is complete without a commercial contact, which differs in degree and kind. Pharmacy holds a valuable franchise and safeguards the independent druggists against the encroachment of stores whose sole purpose is to sell things after attracting trade by "cut" prices on articles which, oftentimes, it is sought to displace. E. G. E.

THE MUSEUM OF THE A. PH. A. HEADQUARTERS.

THE March number of the *Scientific Monthly* contains an interesting article by Dr. F. C. Brown on "Building a Museum to Human Specifications." References are made to writers on the subject in other publications, in which "museum fag" is discussed; B. I. Gilman, in the *Scientific Monthly*, for January 1916, showed a number of pictures, in which the visitor to the museum was unnecessarily fatigued because the things were displayed in a wrong manner. A related article was published in the *Literary Digest* in 1916; in *The Century* for January 1926, F. H. Cooke discusses the subject of "Culture and Fatigue"—the conclusions drawn are that museum fatigue is real and not imaginary.

The problem to be solved is not only one of order and explanatory notes, but a systematic arrangement is essential which will tell the story of whatever is on display, so that the visitors will be interested sufficiently to return and bring others—

that is the test, though this is not the sole purpose of the museum and, perhaps, not the most important. Dr. Brown's presentation describes methods for various displays; the purpose of this comment is to stimulate the interest of those who have historical material suitable for such display in the A. PH. A. Headquarters, partially or wholly, as a permanent record. Our museum should be maintained on a lofty plane; it must also interest casual observers and laymen who will thereby have a better understanding of the mission and accomplishments of pharmacy. The museum should attract and educate; exhibits should show the development of all the divisions of the pharmaceutical industries, the uses of the materia medica and products allied to pharmacy and also their disuse. The Museum will offer to one or more an opportunity for memorializing those who have rendered distinguished services in pharmacy and now that the site has been purchased in a most desirable location for the A. PH. A. Headquarters, the matter should receive early consideration by those who desire to endow this important part of the building.

E. G. E.

MEMORIAL TO O. HENRY.

AS IS well known to pharmacists, O. Henry was an apprentice in the pharmacy of his uncle, Clark Porter, in Greensboro, N. C. and, later, was employed for a time in the pharmacy of Morley Bros. of Austin, Tex. In the latter establishment an unfinished story was begun by O. Henry on the pages of a counter blotter, which came to the attention of an employee years afterward. It was in Dr. Pinckney Herbert's office in Asheville that O. Henry wrote his last complete story, namely, "Let Me Feel Your Pulse." He rests in Riverside Cemetery, Asheville, N. C. It is now proposed to convert the jail which held Sidney Porter a prisoner in Austin, following his conviction on a charge[1] involving the disposition of $100 of bank funds, into a memorial library to O. Henry. The suggestion originated, it seems, with Steve Pinckney of Houston, Tex., whose father worked side by side with Porter in the old Land Office at Austin. It is commented on in *Bunker's Monthly:*

"It ought to be done. It would be decidedly the kind of memorial that O. Henry would appreciate. The 'poetic justice' of it would appeal to him strongly, and one can imagine him chuckling over it, out there across the Great Divide, in whatever Celestial Bagdad he may now reign in as Caliph. It would be a real O. Henry 'unexpected ending' to the story of Will Porter's trial and conviction, when he was 'absolutely innocent of wrong doing'—a proper finish, so to speak, for his 'unfinished story,' for O. Henry died an 'ex-convict' shorn of his citizenship in the land that now delights to do him honor.

"It has been said that Washington Irving legendized the short story, that Edgar Allan Poe standardized it, that Nathaniel Hawthorne allegorized it, that Bret Harte localized it but that O. Henry humanized it. His humanity was his distinguishing characteristic. And what a human thing to do, to take this building, the erection of which was made necessary by human frailty and human passion—a jail!—and convert it into the memorial of a man who possessed, as few others, an understanding of human weakness and a tolerant charity toward human shortcomings, a man who saw beneath the foibles of 'all sorts and conditions of men' a common humanity. What a human memorial it would be!"

The suggestion is a worthy one, and if carried out would represent a small but overdue recompense.

E. G. E.

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[1] It is generally conceded that he was innocent of wrong doing.

BIOGRAPHIES.

A MONUMENTAL twenty-volume "Dictionary of American Biography" is now in preparation. The editor-in-chief is Dr. Allen Johnson. While no pharmacists are listed as contributors there are a number who are well and favorably known to pharmacists; among them, Dr. Edgar F. Smith, Harvey W. Wiley, Charles Thwing, etc. The following societies and their presidents are engaged in the work:

American Philosophical Society, Francis X. Dercum, President; American Academy of Arts and Sciences, Theodore Lyman, President; American Antiquarian Society, Waldo Lincoln, President; American Oriental Society, Julian Morgenstern, President; American Philological Association, Frank C. Babbitt, President; Archaeological Institute of America, Ralph V. D. Magoffin, President; Modern Language Association of America, Ashley H. Thorndike, President; American Historical Association, Henry Osborn Taylor, President; American Economic Association, Thomas S. Adams, President; American Philosophical Association, David F. Swenson, President; American Political Science Association, William B. Munro, President; American Sociological Society, William I. Thomas, President; Linguistic Society of America, Carl D. Buck, President; History of Science Society, David Eugene Smith, President; Mediaeval Academy of America, Charles H. Haskins, President.

The dictionary will not include the biography of any living American and one of the interesting phases of the work of the editors has been the attempt to restore forgotten reputations—that is, to give prominence to Americans who have made some valuable contribution to the national life but who have not been accorded due credit.

Responding to the expressed purpose the Editor addressed Dr. Allen Johnson, editor-in-chief, suggesting that pharmacy and pharmacists be accorded the consideration due them instead of giving sole credit to other activities, even if pharmacists who are sketched earned their fame in these fields of endeavor. As an outstanding example Carl Wilhelm Scheele was referred to and the names of a number of other pharmacists were mentioned who in this editor's opinion were deemed worthy of recognition and were not included in the list under "A" and "B."

The purpose of the letter was to emphasize the fact that pharmacy, as such, has quite frequently been overlooked and that "pharmacist" be the applied term and not divided with other designations, such as druggist, chemist, apothecary, etc. This the writer believes is a matter of importance and has been neglected—we are pharmacists and proud of our profession. A paragraph of an editorial of the *New York Times* is quoted:

"One of the prime purposes of this great undertaking is 'the rehabilitation of forgotten men' and it would fail of that worthy purpose if there were notable omissions. The range is wide enough to include all who have made a distinct contribution to American development or to 'the American scene.'"

Everywhere and more and more the value of history is being recognized and with this valuation the fact is admitted that records of events as to data are more accurate when made at or about the time of their occurrence, although a later judgment of the individuals concerned and the aims and purposes may be more impartial, because it is not so greatly influenced by prejudice and prevailing public opinion. The point is, without records, with dependence on memory, errors will occur and some important events will be forgotten. The A. Ph. A. Headquarters Building, for which a beautiful site has been purchased, will afford opportunities for permanent records of pharmaceutical activities.

SCIENTIFIC SECTION

THE AVAILABILITY OF THE CALCIUM IN CALCIUM LACTATE IN THE HUMAN.

BY FREDERICK W. HEYL AND MERRILL C. HART.

Sherman (1) has shown that calcium equilibrium can be maintained on amounts varying from 0.27 to 0.78 Gm. Ca per 70 Kg. body weight per day. He places the average at 0.45 Gm. In health with a freely chosen diet this quantity is not always present, and in many conditions, characterized by weakened nutritional function, it is frequently below the minimum maintenance requirements. Long continued negative calcium balances are no doubt part of the clinical picture in many chronic subnormal conditions. Again, in many pathological acidotic conditions, (2) characterized by high urinary ammonia and acid, the body appears to be rapidly thrown into a negative calcium balance. This condition clinically is often superimposed upon a previous prolonged negative balance.

Calcium medication is therefore sometimes resorted to, although of late years so much stress has been laid on the value of the fat-soluble vitamins in connection with calcium metabolism that little has been done to learn how the calcium salts themselves function in the matter of calcium balance. However, Sherman and MacLeod (3) found that increasing the fat-soluble vitamin in the diet did not aid in calcium retention in growing rats which were fed a ration consisting of one-sixth whole milk powder and five-sixths whole wheat, whereas the addition of calcium lactate increased the retention. They state that, in view of the large amount of evidence of the presence of a calcification factor in cod-liver oil, "it is somewhat striking to find here such complete success in the promotion of calcification by the addition of calcium to the diet and no appreciable effect of cod-liver oil." They call attention to the effectiveness of simple increase in calcium intake.

There exists a quite general opinion that so far as maintenance is concerned there is little choice among the various salts. This thought may be strengthened by the results of Steenbock, Hart, Sell and Jones (4) who found in experiments with young rats that there was no difference in the availability of calcium lactate, calcium carbonate, calcium phosphate, calcium silicate or calcium sulphate, when fed at certain high levels. They suggest that the acid reaction of the chyme (5) which lends an acidic reaction to a considerable length of the intestine renders the assimilation of the insoluble salts quite possible. The same thought is found in the suggestion that "some" calcium salt is added to the diet as an accessory.

With the recent development of methods for estimating serum calcium, many studies have been made upon the influence exerted upon the blood-calcium level by different calcium salts. Here also, on account of the marked tendency of serum calcium to remain constant despite calcium treatment, little effect has been observed. Where elevations have been noted they have been rather transient and their significance is perhaps of less importance clinically than a corresponding knowledge of calcium retention. Hjort (6) made a comparative study of the effect of calcium chloride, calcium lactate and calcium glycerophosphate and found that when these were administered orally to dogs in amounts equivalent to 0.2727

Gm. CaO per Kg., that they were absorbed rapidly enough to increase the serum-calcium level. On the other hand, insoluble calcium salts were inconsistent in this respect. When calcium lactate was given in lower dosages it simulated the less soluble salts.

Recently Kahn and Roe (7) found that when 5 Gm. of calcium lactate was given orally on each of five days that the blood calcium on the morning of the sixth day had not been elevated. However, by making blood-calcium estimations at hourly periods after the ingestion of this salt, they proved that this value was increased to the extent of 80% and that an elevation above normal was maintained for several hours. Bauer and Ropes (8) obtained increased blood calcium, but the values are of a much lower order. Roe and Kahn (9) found that the rise in blood calcium following the ingestion of solutions of calcium lactate was depressed by the simultaneous ingestion of foods.

The assimilation of calcium lactate is not completely understood, and is perhaps not used clinically in sufficient quantities. Nevertheless, it is the calcium salt which is most frequently employed. It has been reported by Givens and Mendel (10) that it is a "striking fact that 0.34 Gm. calcium oxide per day in 21.7 Gm. skimmed milk, regardless of acid or base, will produce a positive calcium balance, whereas 1 Gm. of calcium oxide in the form of calcium lactate is necessary to the same end." They state that the "relative advantage of the combination in which calcium is fed is thus raised anew."

Bogert and McKittrick (11) established positive calcium balances with doses of 6 Gm. calcium lactate per day in three of four subjects using a four-day test period.

Calcium lactate is used clinically in average doses of 12 grains and in (12) view of the low calcium content (13%) and the other unknown factors in connection with its metabolism, it appeared of fundamental importance to gain some more accurate idea of its utilization. For inasmuch as it has been deemed important to learn the utilization values of many food-stuffs in respect to calcium, so it is of even greater importance for the clinician to learn something of this value for the lactate and other sources of therapeutic calcium.

These experiments were undertaken upon normal subjects who were placed upon a calcium deficient and acidotic diet of bread, coffee, cream, butter, sugar, steak, pork and vegetables. This is a characteristic diet, (13) and tends to the metabolic equilibria upon which is superimposed the clinical condition requiring perhaps calcium medication. This appears a most reasonable basal diet for the purposes of this study.

EXPERIMENTAL.

Five men lived for fifteen days on a fairly uniform, but not monotonous, diet. During a foreperiod of five days, the basal diet, adequate in respect to protein and energy requirements, consisting of steak, potatoes, bread, butter, coffee, lettuce, bananas and cream, supplied about 0.2 Gm. calcium per day and established a decidedly negative balance. During the following ten days, in each of two series of experiments, there was superimposed upon this acidotic diet (1) milk, (2) calcium lactate in solution. The balances for calcium, magnesium and phosphorus were determined in 5-day periods, but all calculations on maintenance requirements are based on the entire 10-day period.

All articles in the diet were analyzed. Butter, milk and cream were from the same dairy. The same cuts of meat were used throughout the experiment. Bread was purchased daily from the same bakery. These dietary constituents were analyzed several times during the course of the experiment to eliminate any possible variation in their mineral content. Coffee was made in a percolator and the water extract used for the analysis. Potatoes were analyzed after being boiled. Distilled water was used entirely for cooking and drinking.

TABLE I.—CALCIUM, MAGNESIUM AND PHOSPHORUS CONTENT OF FOODS USED IN DIETS (PER GM.).

Foods.	Calcium.	Magnesium.	Phosphorus.
Coffee (extract)	0.000303	0.000957	0.001021
Butter	0.000124	0.000010	0.000113
Bread	0.000132	0.000138	0.000750
Cream (per cc.)	0.000878	0.000112	0.000872
Steak	0.000085	0.000287	0.001959
Onions	0.000105	0.000160	0.000306
Potatoes (boiled)	0.000025	0.000139	0.000415
Apple (raw)	0.000054	0.000080	0.000118
Bananas	0.000051	0.000233	0.000266
Milk (per cc.)	0.001320	0.000141	0.001004
Pork Chops	0.000099	0.000197	0.002024
Lettuce	0.000200	0.000142	0.000301
Sugar	*ad lib.*		

Calcium was determined by the McCrudden (14) method. For magnesium the method given in the Official and Tentative Methods of Analysis of the A. O. A. C. was used. Phosphorus was determined by ashing with a mixture of sulphuric and nitric acid, precipitation with ammonium molybdate, and titration of the yellow phospho-molybdate with 0.5 *N* sodium hydroxide. The amount of the precipitating reagent was adjusted to the estimated amount of phosphorus present. When unexpected quantities of the yellow phospho-molybdate were obtained, it was dissolved in alkali and precipitated as magnesium ammonium phosphate and determined gravimetrically by the official method.

The calcium, magnesium and phosphorus content of the foods used are given in Table I. The diets are recorded in Table II.

The 5-day periods are marked off in the feces by the carmine which was taken just before the first meal of each period. Collections were made in weighed pans, in which they were later dried to constant weight with the use of alcohol. Two Gm. of the finely powdered stool was used for analysis. This was ashed at a dull red heat in a platinum dish in the muffle furnace. The platinum dish was washed out quantitatively with hot 0.5 *N* hydrochloric acid and the filtered acid solution used for the determination of calcium and magnesium.

The daily samples of the urine were collected, diluted to 2 liters with water containing 50 cc. of concentrated hydrochloric acid and preserved with toluene. A measured quantity of the urine is evaporated in a platinum dish, ashed and then extracted in a similar manner to the stools.

In Table III is given the daily intake and output of calcium, when upon the calcium deficient basal diet there is superimposed an increment of milk.

The basal experimental diets contained respectively 0.24, 0.285, 0.21, 0.12, 0.17 Gm. calcium per 70 Kg. body weight, with an average of 0.21 Gm. The

TABLE II.—DAILY FOOD INTAKE IN GRAMS.*

Food.	V. W.	E. O.	E. W.	V. Pe and Em.	Ar.
Coffee	18	18	18	27	27
Potatoes	200	250	250	200	300
Bread	160	225	225	150	250
Steak	200	250	250	250	250
Butter	100	100	100	60	125
Cream	90	150**	130	60***	100
Lettuce	50	...	...	...	75
Bananas	150	250	150	250	250
Onions	100	100	100	...	...
Tomatoes	50	100	100	100	...

* Some latitude was allowed to prevent the diet from becoming monotonous. The steak and bananas, for example, were sometimes replaced with pork chops and baked apples containing an equivalent amount of calcium. With these adjustments no difficulty whatever was experienced with constipation. In fact this diet constitutes a typical "business man's diet."

** In the second series the calcium intake of E. O. was decreased chiefly by decreasing the cream intake to 75 cc.

*** In the second series (calcium lactate experiment) V. Pe increased his calcium intake, chiefly by raising cream intake to 100 cc.

daily calcium requirements for maintenance after this deficient period are calculated approximately as follows: 0.85, 0.71, 0.47, 0.60 and 0.76 Gm. calcium per day. Subtracting the intakes of the basal diet, we have the required increments for maintenance, as follows: 0.61, 0.425, 0.26, 0.48 and 0.59 Gm. For the purpose of comparison these values may be stated to be equal to 4.7, 3.3, 2.0, 3.7 and 4.6 Gm. calcium lactate, with an average of 3.6 Gm.

In four of the five trials an appreciable part of the added calcium was excreted by the kidney (4%–15%).

TABLE III.—AVERAGE DAILY INTAKE AND OUTPUT OF CALCIUM.

(*Milk Experiments.*)

Subject.	Body weight, Kg.	Added Ca, Gm.	Period.	Output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
V. W.	50		Ca-low	0.72	0.84	1.56	0.176	—0.14	
		0.460	Ca-high	1.17	1.79	2.96	0.638	+0.05	
		0.460	Ca-high	0.99	2.17	3.16	0.638	+0.01	+0.03
E. O.	61		Ca-low	0.37	1.02	1.39	0.246	—0.04	
		0.476	Ca-high	0.54	2.33	2.87	0.722	+0.15	
		0.476	Ca-high	0.59	2.72	3.31	0.722	+0.06	+0.10
E. W.	73		Ca-low	0.59	1.64	2.23	0.224	—0.22	
		0.508	Ca-high	0.33	2.04	2.38	0.732	+0.26	
		0.508	Ca-high	0.47	2.08	2.55	0.732	+0.22	+0.24
V. Pe	89		Ca-low	0.83	0.85	1.68	0.146	—0.18	
		0.571	Ca-high	0.94	2.53	3.47	0.717	+0.02	
		0.571	Ca-high	0.98	3.08	4.06	0.717	—0.09	—0.04
Em	57			0.47	1.20	1.67	0.14	—0.19	
		0.528		0.67	2.38	3.05	0.668	+0.06	
		0.528		0.67	2.50	3.17	0.668	+0.04	+0.05

In Table IV is given the daily intake and output of calcium, when upon the calcium deficient diet there is superimposed an increment of calcium as lactate. The intake of calcium per day per 70 Kg. man varied as follows: 0.17, 0.14, 0.19, 0.22 and 0.23 Gm., with an average of 0.19 Gm. The daily calcium requirements for maintenance calculated are approximately as follows: 1.25, 1.1, 1.6, 1.3 and 1.9 Gm., calcium per day. Subtracting the intakes of the basal diet, we have the required increments for maintenance as follows: 1.08, 0.96, 1.41, 1.08 and 1.67 Gm., which would be supplied by 8.3, 7.39, 10.85, 8.3 and 12.86 Gm. of calcium lactate. The average increment of the five determinations is 9.5 Gm. Using 6.0 Gm. doses, Bogert and McKittrick report 3 positive balances in four trials, but they used a shorter period (4 days) instead of 10 days. Their method is favorable to lower calcium increments.

Of the *increased* ingested calcium (as lactate) 9% left *via* the urine in Em; 11% in V. Pe; 6% in E. O.; 8% in E. C. W; 12% in Ar.

TABLE IV.—AVERAGE DAILY INTAKE AND OUTPUT OF CALCIUM.

(*Calcium Lactate Experiments.*)

Subject.	Body weight, Kg.	Added Ca, Gm.	Period.	Output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
Em	60	*	Ca-low	0.40	1.53	1.93	0.145	—0.24	
		1.00	Ca-high	0.84	3.64	4.48	1.145	+0.25	
		1.00	Ca-high	0.84	5.43	6.28	1.145	—0.11	+0.07
V. Pe	89		Ca-low	0.77	1.08	1.55	0.181	—0.19	
		1.25	Ca-high	1.56	3.92	5.48	1.431	+0.34	
		1.25	Ca-high	1.40	7.05	8.45	1.431	—0.26	+0.04
E. O.	60		Ca-low	0.36	1.36	1.73	0.164	—0.18	
		1.25	Ca-high	0.68	5.64	6.32	1.414	+0.15	
		1.25	Ca-high	0.80	6.86	7.67	1.414	—0.12	+0.02
E. C. W.	73		Ca-low	0.54	1.83	2.37	0.227	—0.25	
		1.25	Ca-high	1.00	5.78	6.79	1.477	+0.12	
		1.25	Ca-high	1.01	5.63	6.64	1.477	+0.15	+0.13
Ar	60		Ca-low	0.49	0.86	1.35	0.201	—0.23	
		1.50	Ca-high	1.42	5.21	6.63	1.701	+0.38	
		1.50	Ca-high	1.28	8.51	9.79	1.701	—0.25	+0.06

* After a few preliminary determinations, the feedings were made at approximately the required level for maintenance. For example, Em was negative on an increment of 0.75 Gm. as lactate. The lactate was given in a glass of distilled water, in 3 doses between meals, and at night, so that the food interfered with the absorption as little as possible (10 A.M., 3 P.M., 9 P.M.).

In Table IIIA, the effects of the addition of increments of calcium in the form of milk to the deficient diet is noted on the phosphorus balances. In Table IIIB we record the results obtained at the same time in respect to magnesium balances. As has been noted before, such additions lead to positive balances in respect to phosphorus, but the magnesium balances are not to any noticeable degree favorably influenced. The addition of milk increased the urinary, as well as fecal, excretion of calcium and also of magnesium.

TABLE IIIA.—AVERAGE DAILY INTAKE AND OUTPUT OF PHOSPHORUS.

(*Milk Experiments.*)

Subject.	Phosphorus output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Average balance, intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
V. W.	2.92	0.81	3.73	0.80	+0.05	
	4.10	1.14	5.24	1.15*	+0.10	
	4.16	1.28	5.44	1.15	+0.06	+0.08
E. O.	3.50	1.20	4.70	1.04	+0.10	
	3.75	1.46	5.21	1.33**	+0.29	
	4.22	1.81	6.03	1.38	+0.17	+0.23
E. W.	3.28	1.37	4.65	1.01	+0.07	
	4.42	1.41	5.83	1.32***	+0.15	
	4.45	2.03	6.48	1.37	+0.08	+0.11
V. Pe	4.00	1.18	5.18	0.86	—0.17	
	4.19	2.06	6.25	1.27x	+0.02	
	4.62	2.12	6.74	1.27	—0.08	—0.03
Em	3.64	1.41	5.05	0.91	—0.10	
	3.99	1.66	5.65	1.26xx	+0.13	
	4.07	1.63	5.70	1.26	+0.12	+0.13

* Increment 0.35 Gm. per day.
** Increment 0.28 Gm. per day.
*** Increment 0.31 Gm. per day.
x Increment 0.41 Gm. per day.
xx Increment 0.35 Gm. per day.

TABLE IIIB.—AVERAGE DAILY INTAKE AND OUTPUT OF MAGNESIUM.

(*Milk Experiments.*)

Subject.	Magnesium output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Average balance, intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
V. W.	0.42	0.54	0.96	0.19	0.00	
	0.58	0.68	1.27	0.25	—0.01	
	0.51	0.67	1.18	0.25	+0.01	+0.00
E. O.	0.46	0.73	1.19	0.25	+0.02	
	0.57	0.64	1.22	0.28	+0.03	
	0.51	0.92	1.43	0.31	+0.03	+0.03
E. W.	0.49	0.66	1.15	0.23	±0.00	
	0.67	0.63	1.31	0.26	±0.00	
	0.70	0.80	1.50	0.29	—0.01	—0.007
V. Pe	0.58	0.74	1.32	0.19	—0.07	
	0.61	0.94	1.55	0.26	—0.05	
	0.70	1.10	1.80	0.26	—0.10	—0.07
Em	0.47	0.96	1.43	0.23	—0.06	
	0.52	0.98	1.50	0.25	—0.05	
	0.52	0.93	1.45	0.27	—0.02	—0.03

In Table IVA, the effect of the addition of calcium lactate on the phosphorus balances are tabulated. In Table IVB, the magnesium balances are reported. In respect to phosphorus, it is observed that negative balances are decreased,

chiefly by decreasing the urinary output to a greater extent than the fecal calcium is increased.

In respect to magnesium, we note that urinary excretion is decreased but that, nevertheless, in 3 out of 5 cases, the magnesium losses are slightly increased.

TABLE IVA.—AVERAGE DAILY INTAKE AND OUTPUT OF PHOSPHORUS.

(*Calcium Lactate Experiments.*)

Subject.	Phosphorus output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
Em	3.87	1.56	5.43	0.871	—0.21	
	3.06	1.29	4.35	0.887	+0.01	
	2.91	1.86	4.77	0.913	—0.04	—0.02
V. Pe	4.41	1.30	5.71	0.920	—0.22	
	3.09	1.28	4.37	0.869	—0.01	
	2.72	2.54	5.26	0.911	—0.14	—0.07
E. O.	2.55	1.45	4.00	0.910	—0.11	
	2.59	1.31	3.90	0.846	+0.06	
	2.47	2.07	4.54	0.897	—0.01	+0.02
E. C. W.	3.99	1.36	5.35	0.995	—0.07	
	3.50	1.81	5.31	1.000	—0.06	
	3.09	1.47	4.56	0.964	+0.05	—0.01
Ar	4.30	1.53	5.83	0.941	—0.22	
	3.51	1.52	5.03	0.902	—0.10	
	3.42	1.66	5.08	0.902	—0.11	—0.11

TABLE IVB.—AVERAGE DAILY INTAKE AND OUTPUT OF MAGNESIUM.

(*Calcium Lactate Experiments.*)

Subject.	Magnesium output (5-day periods). Urine, Gm.	Feces, Gm.	Total, Gm.	Intake per day, Gm.	Balance per day, Gm.	Average balance 10 days, Gm.
Em	0.47	1.13	1.60	0.204	—0.11	
	0.49	0.85	1.34	0.219	—0.05	
	0.46	1.19	1.65	0.234	—0.10	—0.08
V. Pe	0.60	0.77	1.37	0.231	—0.04	
	0.58	0.55	1.13	0.200	—0.03	
	0.50	1.09	1.59	0.231	—0.09	—0.06
E. O.	0.42	0.97	1.39	0.241	—0.04	
	0.41	0.88	1.29	0.219	—0.04	
	0.41	1.08	1.49	0.236	—0.06	—0.05
E. C. W.	0.65	0.52	1.17	0.224	—0.01	
	0.63	0.80	1.43	0.229	—0.06	
	0.60	0.69	1.29	0.212	—0.05	—0.05
Ar	0.71	0.97	1.68	0.255	—0.08	
	0.63	0.81	1.44	0.216	—0.07	
	0.57	0.83	1.40	0.216	—0.06	—0.06

CONCLUSIONS.

1. When calcium lactate is superimposed for ten days upon an acidotic calcium-deficient but vitamin-containing diet, a quantity amounting to approximately 9.5 Gm. is required to establish calcium equilibrium. Compared with milk, this represents 2.5 or more times as much calcium as is necessary using the latter.

2. The urinary calcium excretion was markedly increased, about 10% of the calcium increment taking this route of excretion. The same tendency is noted in using milk.

3. The urinary phosphorus excretion was decreased and phosphorus retention secured by the ingestion of calcium lactate. In this diet the original Ca:P ratio was 2:9; and the favorable influence upon phosphorus metabolism may be due to the establishment of a more favorable balance of 14:9. However, in the case of milk experiments, a ratio of 5:9 yielded a more decided phosphorus retention.

4. Concerning the effect of calcium lactate upon magnesium metabolism, slightly increased losses were noted in three of the five subjects.

BIBLIOGRAPHY.

(1) Sherman, "Chemistry of Food and Nutrition," 2nd Edition, p. 264.
(2) John O. Halverson, Henry K. Mohler and Olaf Bergeim, *J. Biol. Chem.*, 32 (1917), 171.
(3) H. C. Sherman and F. L. MacLeod, *J. Biol. Chem.*, 64 (1925), 451.
(4) H. Steenbock, E. B. Hart, M. T. Sell and J. H. Jones, *J. Biol. Chem.*, 56 (1923), 375.
(5) J. H. Long and F. Fenger, *J. Am. Chem. Soc.*, 39 (1917), 1278.
(6) Axel M. Hjort, *J. Biol. Chem.*, 65 (1925), 791.
(7) B. S. Kahn and J. H. Roe, *J. A. M. A.*, 86 (1926), 1761.
(8) W. Bauer and M. W. Ropes, *J. A. M. A.*, 87 (1926), 1902.
(9) J. H. Roe and B. S. Kahn, *J. A. M. A.*, 88 (1927), 980.
(10) M. H. Givens and L. B. Mendel, *J. Biol. Chem.*, 31 (1917), 421.
(11) L. Jean Bogert and E. J. McKittrick, *J. Biol Chem.*, 54 (1922), 363.
(12) U. S. Pharmacopœia X, 91.
(13) Dr. Paul G. Shipley, *J. A. M. A.*, 79 (1922), 1573.
(14) F. H. McCrudden, *J. Biol. Chem.*, 7 (1909–10), 83.

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GOLD COMPOUNDS FOR MEDICINAL USE.*

BY F. R. GREENBAUM.

Gold has been used as a drug for many centuries. Abu Moussa Gafar (1) recommended gold in the middle of the eighth century as a remedy for administration to human beings, animals and plants. He believed that all metals were diseased except gold.

Ebu Sina, (2) better known as Avicenna (Arabia, 978–1036), recommended gold, silver and other metals for internal use as blood purifiers. Pills were coated with gold foil and gold paper.

Bombastus Paracelsus (1493–1541), alchemist and chemist, recommended gold

* Scientific Section, A. PH. A., St. Louis meeting, 1927.

for diseases of the heart. His "elixir of life" is a mixture of gold and mercury. He was the first to recommend gold in the treatment of tuberculosis.

Robert Koch (3) (1890) found that gold cyanide, auro and auri cyanide Au (CN) and $Au(CN)_3$ inhibit the growth of the tubercle bacilli in a dilution of 1:2,000,000 in vitro. In the animal body it does not possess such great bactericidal power.

J. B. White (4) in 1891 recommended gold and sodium chloride ($AuCl_3NaCl$) combined with manganese iodide. Considerable improvement of the symptoms of the disease was noted but it was found to be too poisonous.

From 1912 to 1915, the study of gold was in the hands of German investigators. Men like Arthur Meyer, Oberstadt, Heubner, Bruck and Glueck concentrated their attention on the gold treatment of tuberculosis. Heubner (5) pointed out the capillary poisoning effect of gold and platinum salts.

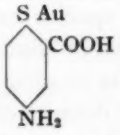
Bruck and Glueck (6) after R. Koch used gold cyanide and found that it healed the tuberculosis lesions but also caused severe poisoning effects. Poor (7*a*) and Geber (7) used potassium gold cyanide successfully in tuberculosis of the skin. Potassium gold cyanide is less poisonous than gold cyanide, though its toxic properties are still high.

Adolf Feldt (8) used gold cyanide intravenously and subcutaneously and found that it caused a local reaction in the tuberculous organs. Feldt believes that the gold salts attack the tubercle bacilli in a selective way, kill them and thus form toxins on the wall of the cells which cause an inflamed hyperæmia.

Arthur Meyer (9) reported similar experiences with gold potassium cyanide.

In 1914, Spiess and Feldt (10) brought out a new remedy; recognizing the high toxicity of gold cyanide on the one hand and its healing effect on tuberculous organs on the other, they tried to find a carrier which would decrease its toxicity. They used cantharidin, which has a marked affinity for tubercular organs. In order to decrease the toxicity of cantharidin, they combined it with ethylenediamine, by which combination the toxicity is lowered 700 times. This monocantharidyl ethylenediamine is used as a carrier for gold cyanide, with which it combines readily. This combination called "Aurocantan" was found to be less poisonous than gold cyanide and represented a marked advance in the treatment of tuberculosis. It was given subcutaneously but caused necrosis when administered for a long time.

A still better and less toxic gold compound was prepared in 1917. Feldt and Spiess (11) once more introduced a new gold preparation in which the gold was introduced into an organic compound. This preparation is called "Krysolgan" and is the gold-sodium salt of an aminothiophenolcarbonic acid

"Krysolgan" has the following formula: 

a compound representing aminothiosalicylic acid in which the gold entered into the linking to the sulphur.

It is manufactured by the Hoechster Farbwerke, Hoechst am Main, and is available in German markets. Feldt pointed out that "Krysolgan" acts as a catalyst only and as such is used in very small doses (a few mg.). In acting upon the tuberculous tissues, "Krysolgan" causes a scarification and through

this, the tubercle bacilli are killed. Feldt recommends very small doses at very long intervals. The drug was found to be very effective in pulmonary tuberculosis. "Krysolgan," in combination with the hygienic-dietetic treatment, is very advisable for those patients who can give up their occupations. In those who cannot do so, "Krysolgan" should be given in large doses. Unlike arsphenamine and neoarsphenamine which have a direct action upon the spirochetes, the gold preparations act upon the tubercle bacilli indirectly.

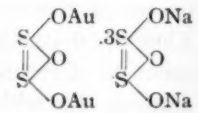
"Krysolgan" causes reactions such as exanthema, nephritis, icterus, hemorrhagia, etc. Heubner and Gelpke (12) proved that gold, like other heavy metals, has an injurious effect on the capillary walls. But Spiess and Feldt insist that these reactions are confined to the tubercular tissues.

"Krysolgan" cannot be used in cases of advanced tuberculosis or in cases with continuous high temperature.

In 1924, Professor Mollgaard (13) of Copenhagen, Denmark, introduced another gold compound which he called "Sanocrysin." It is by no means a new compound. Chemically speaking, it is gold-sodium thiosulphate, a complex gold salt, in which the gold is in the aurous form or monovalent form. It was found that the aurous form of the gold is less toxic than the auric form.

Gold-sodium thiosulphate was used in the middle of the nineteenth century in the photographic process, for which purpose it was employed in a mixture containing 2% gold chloride and 2% sodium thiosulphate. Fordos and Gelis (14) French chemists, investigated this mixture in 1845 and succeeded in isolating gold-sodium thiosulphate of the formula: $Au_2S_2O_3.3Na_2S_2O_3.4H_2O$. This drug is not yet available on the market but it is used in certain hospitals and sanitariums in England, America, Denmark and Germany.

"Sanocrysin" has the structural formula somewhat like this:



A number of methods of preparation have been elaborated since its introduction by Professor Mollgaard. Lucille Eichelberger and K. McCluskey (16) have published an excellent method which, however, is too expensive. A. T. Gelarie and F. R. Greenbaum (17) and H. Brown (18) have published methods of preparation of "Sanocrysin" which are very simple and efficient in yield.

If injected intravenously, "Sanocrysin" causes reactions only in the tubercular tissues but it is harmless and non-poisonous in the normal body. It has a somewhat sweet taste. Professor Mollgaard believes that it affects the tubercle bacilli but at the same time liberates harmful toxins. It order to prevent these reactions, he recommends a specific antitoxin serum which he injects simultaneously with or following an injection of "Sanocrysin."

The number of patients treated with this product in England and Denmark is still too small to warrant definite conclusions. It is certainly not as sure and potent a remedy in tuberculosis as arsphenamine is in syphilis.

Of 134 cases of pulmonary tuberculosis treated with "Sanocrysin" in Denmark, twenty died as a result of the drug, nineteen became worse, thirty improved and only twenty-five (six severe) were cured. (14*a*).

The specific resistance of the tubercle bacilli is due to their layer of fatty sub-

stances by which they are surrounded and protected. Professor Mollgaard's chemotherapeutic considerations which are presented in his book entitled "Chemotherapy of Tuberculosis" are as follows:

"Any drug capable of destroying the *T. bacilli* must penetrate their fatty layer. Tuberculosis tissues are very poor in blood vessels. The bacilli can be reached by diffusion only. The compound must there be rapidly diffusive and sufficiently stable within the organism to remain unaltered when reaching the bacteria. The gold as has been mentioned before, should be in the aurous form and in a real complex." "Sanocrysin" answers all these requirements.

In 1925 another gold preparation was proposed. It is known as "Triphal" and is manufactured by the Horchst Farbwerke Hoechst am Main. "Triphal" is the sodium salt of aurothiobenzimidazolcarbonic acid. It is very readily soluble in water and is injected intravenously.

The initial dose as prescribed by the Farbwerke is 0.025. The minimum dose is 0.001, the maximum 0.2. N. Galatzer and A. Sachs (15) studied this new compound and obtained good results in thirty cases out of forty. They believe that "Triphal" inhibits the growth of tubercle bacilli and increases the formation of anti-toxin substances. They did not notice any capillary poisoning in the course of the treatment. General reactions with "Triphal" are mild, slightly increase in temperature immediately after the injection, headache, tired feeling and drowsiness. These symptoms disappear after twenty-four hours. Galatzer and Sachs claim that they did not observe any kidney disorders or intestinal disturbances which frequently follow treatment with gold compounds. "Triphal" causes an increase in weight shortly after injection.

This drug seems to be very promising; in very advanced cases, however, it is a failure.

In studying the various gold compounds which have been developed within the past ten years and which are used in medicine as described above, one is impressed by one outstanding fact: that the number of gold compounds containing sulphur exceed those which do not contain sulphur. There is a certain affinity of gold for sulphur and the presence of sulphur in an organic compound practically insures the formation of a gold compound.

GOLD COMPOUNDS CONTAINING SULPHUR.

Gold thiophenol C_6H_5SAu developed and patented by the Farbwerke Meister, Lucius & Brunning, Hoechst of Main, (20), which is a gold salt of thiophenol

containing 64.3% of gold. It is of interest to note that no corresponding gold compound of phenol is known.

Similar to gold thiophenol is the gold salt of thiosalicylic acid, also developed and patented by the Farbwerke. (21).

The gold-sodium salt of an aminothiosalicylic acid is the before-described "Krysolgan." It is again noteworthy to point that there is no corresponding gold compound of salicylic acid nor of aminosalicyclic acid.

Another group of compounds of which gold salts are known and which at the same time contain sulphur, is as follows:

Thiourea-hydrochlorauric acid, I; thioureahydrochlorauric acid hexamethylenetetramine, II; Thiosinamine hydrochlorauric acid, III; and Thiosinamine hydrochlorauric acid hexamethylenamine, IV.

These compounds can be considered as salts of the base; the thiocarbamide with hydrochlorauric acid, according to the following formulas:

I. $CS(NH_2)_2 \cdot HAuCl_4.4H_2O$ II. $CS(NH_2)_2 \cdot (CH_2)_6N_4HAuCl_4.4H_2O$

III. $CS(NH_2)(NH{-}CH_2{-}CH{=}CH_2) \cdot HAuCl_4.4H_2O$ IV. $CS(NH_2)(NH{-}CH_2{-}CH{=}CH_2) \cdot (CH_2)_6N_4.HAuCl_4 4H_2O$

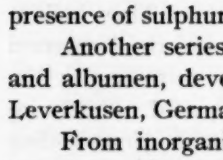
These gold salts of thiourea and thiosinamine, described by H. Brown (22), are insoluble in water. Addition compounds of these with hexamethylenetetramine were prepared which proved to be water soluble. It may also be emphasized in this connection that no gold salt of urea or alkylurea has so far been known. The presence of sulphur seems to be essential for the formation of gold salts.

Another series of gold compounds are the water-soluble gold salts of peptone and albumen, developed and patented by the Farbwerke, vormals F. Bayer of Leverkusen, Germany. (23).

From inorganic sulphur containing gold compounds, the following deserve mention: The various rhodamides, such as potassium aurirhodamide, ammonium aurirhodamide, etc. All of these compounds contain gold as well as sulphur, as the following formulas show: $(K)Au(CNS)_4$ $(NH_4)Au(CNS)_4$.

The toxicity of these compounds is too high, however, thus making them valueless therapeutically. Another inorganic gold compound containing sulphur and also gold, is gold-sodium thiosulphate, introduced in medicine as "Sanocrysin" and described before. This compound contains about 34% of gold and 24% of sulphur.

Another gold compound of very recent date which has been tried out in connection with tuberculosis is the before-mentioned "Triphal." This compound is the gold-sodium salt of thiobenzimidazolcarbonic acid of the following formula:



It also contains a gold-sulphur linking. It is being clinically investigated as a probable remedy for tuberculosis.

NON-SULPHUR CONTAINING GOLD COMPOUNDS.

"Aurocantan" is a combination of cantharidin with ethylenediamine gold cyanide. It was introduced by Feldt and Spiess, as mentioned before and used in tuberculosis. It was found, however, to be too poisonous.

"Goldnapthol Blue" is a gold salt of the dye napthol blue.

Then there are several addition compounds with hydrochlorauric acid and organic compounds which do not contain sulphur, such as benzamide and acetamide hydrochlorauric acid (24) of the formula: $2C_6H_5CH_2NH_2.HAuCl_4.4H_2O$ and $2CH_3CO NH_2.HAuCl_4.4H_2O$. Then additional compounds with gold-cyanide chloride and hexamethyleneaminomethylchloride and similar compounds are known. (25).

The number of gold compounds that have therapeutic value and which contain sulphur is undoubtedly greater than the sulphur-free combinations. Chemists and chemotherapeutists working along these lines, therefore, seem to be led by the idea of selecting compounds containing sulphur in which gold is then introduced, because a real organic gold compound, a carbon-gold linking, has heretofore not been known. Very recently, however, M. Kharash and H. S. Isbell (26) succeeded in preparing compounds containing carbon-gold linking. The method which they have elaborated is as follows:

Anhydrous gold chloride is prepared by evaporating a solution of the commercial hydrochlorauric acid to dryness, then heated to 160° C. Then a dry current of chlorine is passed over it and finally dried in a curent of air. This anhydrous gold chloride is treated with benzene, the reaction allowed to proceed for only 60 to 90 seconds and is arrested by the addition of ether. The precipitate thus obtained is recrystallized from alcohol. It represents phenylauridichloride and the following reaction takes place: $C_6H_6 + AuCl_3 \longrightarrow C_6H_5AuCl_2 + HCl$. It is a yellow substance, insoluble in water. Instead of benzene, napthalene, diphenyl or toluene can be used. The other method which they employed is based upon Grignard's reactions.

All radicals more negative than phenyl will react. All radicals less negative than phenyl will not react with AuCl. Aurous chloride, which is insoluble in solvents, was made soluble by combining it with carbon monoxide. Aurous chloride was dissolved in H_2O and carbon monoxide was bubbled through. A white crystalline substance, aurous chloride carbonyl, is obtained. It sublimes between 80° and 100° C., and this aurous chloride carbonyl can be used for Grignard's reaction. The disadvantage of the gold compound thus obtained lies in the fact that they are water insoluble, although Kharash (27) claims to have succeeded in making them water soluble by using hexamethylenamine, or sodiumchloride. Each class of organic gold compounds is really a problem in itself and has to be worked out separately. Further research will throw more light on these real carbon-gold compounds and will also prove whether this type of compounds is therapeutically useful.

European investigators, particularly German and French scientists, still adhere to the old theory of gold-sulphur linking and very recently, Charles Lormand, in his Paris letter (28) reported on a new compound of gold which may be used in therapeutics. This compound worked out by Lumière, represents sodiumthiopropanol sulphonate, having for its formula:

$$\begin{array}{l} CH_2\text{—}SAu \\ | \\ CH_2\text{—}OH\text{—}CH_2SO_3Na. \end{array}$$

This compound is obtained by the action of sodium thiopropanol-sulphonate on gold chloride. German investigators of recent date also point out that the gold-sulphur linking offers the best chance for the formation of gold compounds which are therapeutically of importance. It remains to be seen whether the real organic gold compounds, the carbon-gold linking, as elaborated by Kharash and Isbell, offer any advantage over the gold-sulphur linking.

BIBLIOGRAPHY.

(1) Abu Moussar Gafar, reviewed in the "Healing Art" (1887), p. 145.
(2) Ebnu Sina Sprengel, Arzneikunde.
(3) R. Koch, *Deutsche med. Wochenschrift* (1890), p. 757.
(4) J. B. White, *Am. Med. Surg. Bull.*, 7 (1894), 388.
(5) Heubner, *Archiv fuer experimentelle Pathologie und Pharmakologie* (1921), p. 8.
(6) Bruck & Glueck, *Muenchener med. Wochenschrift*, 60 (1913), 57.
(7) Geber, 1913, Abstract in *Internationales Centralblatt fuer die gesamte Tuberkulosen-Forschung*, 8 (1913–1914), 337.
(7a) Poor, *Deutsche med. Wochenschrift*, 39 (1913), 2303.
(8) A. Feldt, *Ibid.*, 39 (1913), 549.
(9) A. Meyer, *Ibid.*, 39 (1913), 1678.
(10) Spiess and Feldt, *Ibid.*, 40 (1914), 579; and *Berliner klinische Wochenschrift*, 52 (1915), 365.
(11) Spiess and Feldt, *Berliner klinische Wochenschrift* (1918), pp. 220–223.
(12) Gelpke, *Archiv fuer experimentelle Pathologie und Pharmakologie* (1921), p. 280.
(13) Mollgaard, "Chemotherapy of Tuberculosis," Copenhagen, Denmark.
(14) Fordos and Gelis, *Ann. chim. phys.*, 3 (1845), 394.
(14a) *Journal of Chemotherapy* (July 1926).
(15) N. Galatzer and A. Sachs, *Wiener klinische Wochenschrift*, 38 (1925), 583–585.
(16) L. Eichelberger and K. McCluskey, *J. Am. Chem. Soc.*, Vol. 49 (Jan. 1927).
(17) A. J. Gelarie and F. R. Greenbaum, *Am. Review of Tuberculosis* (Dec. 1926) and *Clinical Medicine* (Jan. 1927).
(18) H. Brown, *J. Am. Chem. Soc.*, 69 (1927), 958.
(19) A. Feldt, *Klinische Wochenschrift*, 3 (1926), 299.
(20) D. R. P. 349,012. (21) D. R. P. 349,032.
(22) H. Brown, *Archives of Dermatology & Syphilology*, 13 (1926), 43.
(23) D. R. P. 335,159.
(24) *Central Blatt*, 2 (1925), 770.
(25) *Ibid.*, 2 (1915), 54.
(26) M. Kharash and H. S. Isbell, Direct Auration. "The Formation and Stability of Gold-Carbon Compounds from the Standpoint of the Theory of Partial Polarity." Paper presented at the Philadelphia meeting, *Amer. Chem. Soc.* (September 1926).
(27) Private communication from M. Kharash.
(28) *News Edition* of June 20, 1927, *Ind. Eng. Chemistry*, p. 7. A. Lumière and F. Perrin, *Compt. rend. de'l académie des sciences* (April 1927), p. 101.

THE HEMOLYTIC ACTIVITY OF ATRIPLEX CANESCENS.*

BY M. R. MILLER.[1]

DESCRIPTION OF THE PLANT.

Atriplex canescens, James, is a shrub found growing in the desert flats or washes of the Mohave and Colorado Deserts, west to San Bernardino and San Diego; east to Nevada and Dakota and south to Mexico. It appears as a roundish gray shrub, 1 to 5 feet high with linear, entire leaves, narrowed at the base, 3/4 to 1 1/4 lines long, finely scurfy and canescent. The flowers are mostly dicœcious and very dense in fruit. The fruiting bracts form a thick, hard body, 3 to 4 lines long.[2] The plant has several common names as "saltbush," "chamiso brush," and "shad scale," the latter name being used in reference to the plant in this article.

* Published by permission of the Director of the Nevada Agricultural Experiment Station.

[1] Chemist, Nevada Agricultural Experiment Station.

[2] W. L. Jepson, "A Flora of California," Part IV, H. S. Crocker Co., San Francisco, 1914.

Shad scale is generally held by stockmen to be a valuable browse and forage plant of the vast areas of a large portion of the West. It affords a succulent browse at a time of the year when there are but few forage plants available and its abundance in the wide valleys is such that quantities of feed are provided by it.

Attention has been called, from time to time in Nevada, to losses of sheep in areas in which shad scale is abundant and in which no plants known to be poisonous could be found. Feeding experiments at the Nevada Experiment Station with both sheep and rabbits have indicated that shad scale does not possess the nutritive qualities which might be expected of a plant of such luxurious growth and that it is toxic under certain conditions. In the laboratory it has been demonstrated that shad scale contains a substance, or group of substances, which are capable of producing pathological conditions and which have the properties of the class of compounds known as saponins.

SAPONINS AND HEMOLYSIS.

The most outstanding property of the saponins, aside from their foam-forming properties, is that of hemolytic activity. A substance which is hemolytically active is, in brief, one which has such an action on red corpuscles of blood as to destroy or to break them up. This action is readily distinguished by the so-called "laking" of a suspension of the corpuscles. A suspension of red blood corpuscles in an isotonic salt solution presents an opaque appearance. If left to stand quietly, the corpuscles will soon settle to the bottom of the vessel leaving a clear and colorless supernatant liquid. If "laking" has taken place, *i. e.*, if the corpuscles have been broken up, the liquid will appear transparent and of a red color due to the liberation of the coloring matter of the corpuscles. On standing there will be no settling as in the suspension above described.

Laking may be produced in a number of ways. It may be produced by many chemical substances, both organic and inorganic. The hemolytic reaction serves as a differential biological test for certain organisms and may be applied as a test for the presence of saponins. The saponins, as a group, are hemolytically active, their relative activity varying with their constitution, when other conditions as time, temperature and concentration are equal.

The hemolytic test for saponins is conveniently carried out at ordinary temperatures by adding a solution of the active substance in physiological salt solution to a suspension of washed red blood corpuscles. The suspension will then become clear after a time interval depending on the concentration of the saponins and corpuscles and the hemolytic power of the saponin. By using uniform concentrations it is possible to judge the relative concentration of the saponin in question; or the relative hemolytic activity of a given saponin may be determined. The results here reported on the variation of the hemolytic activity of the plant throughout the year were obtained by the following technique:

Corpuscle Suspension.—Twenty cubic centimeters of fresh defibrinated rabbit blood are centrifuged and the corpuscles washed several times with physiological salt solution (0.9% NaCl). When the washings are colorless and apparently free from serum, the corpuscles are suspended in 1000 cc. of the saline solution.

Plant Extract.—Two grams of the air-dried and powdered plant are shaken

with 100 cc. of saline solution and allowed to stand at least an hour. The mixture is then filtered clear and the filtrate used for further dilution.

Making the Test.—Into each of a series of test-tubes is pipetted 10 cc. of the corpuscle suspension. Care must be taken that the suspension be shaken up each time before removing a portion. To each of the tubes is added 10 cc. of the solution to be tested. The time required for clearing is noted. The point at which the liquid may be considered clear is when coarse printing is legible through the tube and there are no corpuscles settled at the bottom of the tube. This time is taken as the time for hemolysis.

VARIATION OF TIME OF HEMOLYSIS WITH DILUTION.

To demonstrate the variation of time for hemolysis to take place with a change in concentration of a saponin solution the following experiment was performed.

A two-gram sample of the dry powdered plant was macerated for a short time with 100 cc. of the physiological salt solution, filtered and the clear filtrate used. This dilution (2:100) when used with equal parts of suspension gives a dilution of 1:100 in the test. Three dilutions were made with this solution. The times necessary for hemolysis are given in Table I.

TABLE I.

EFFECT OF DILUTION ON TIME FOR HEMOLYSIS.

Dilution.	Time.
1:100	Immediate
1:500	15 minutes
1:1000	30 minutes
1:5000	No action in 15 hours

VARIATION OF HEMOLYTIC ACTIVITY THROUGHOUT THE YEAR.

To determine whether there is a variation in the hemolytic activity in shad scale through the year a series of small collections were made from the same plants in one locality. The samples were air dried, ground to 100 mesh and preserved in tightly stoppered bottles.

The corpuscles of rabbit's blood were used prepared as outlined above. The test-tubes used were selected for uniformity of bore in order to give more comparable results.

Two dilutions were selected, 1:1000 and 1:1500, as these were found to give laking in a convenient time. Duplicate tests (A and B) were run at each dilution.

The variation in the time for hemolysis with the season indicates (*a*) a change through the year of the quantity of the active substance, its constitution remaining

TABLE II.

HEMOLYTIC ACTIVITY ON SAMPLES TAKEN THROUGH THE YEAR.

Sample collected. Dilution.	Time for hemolysis, seconds. 1:1000.		1:1500.	
	A.	B.	A.	B.
May 3, 1925	60	58	80	76
June 3	105	92	135	142
July 2	90	66	105	99
Aug. 11	120	95	225	173
Sept. 20	150	157	420	375
Nov. 22	90	80	135	123
Jan. 8, 1926	60	65	85	81
Mar. 10	45	40	55	49

constant, or (*b*) a change in the chemical character of the substance, its quantity remaining constant, or, (*c*) more likely, a change in both the quantity and constitution.

From these data it may be seen that the plant has its least hemolytic activity, *i. e.*, may be assumed to be least toxic, in late summer and fall, increasing to a maximum in early spring. There is also a small drop in the summer about during the periods of June and July. What the significance of this drop is, is not known. It may refer to a fluctuation in the weather which influenced the growth of the plant, moisture conditions or other causes. The increase in the hemolytic activity of the plant, however, coincides with the observed periods of increased toxicity of the plant for sheep during the feeding experiments.

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p_H DETERMINATIONS IN ALCOHOLIC SOLUTIONS.

BY RALPH B. SMITH.

The effect of changes in the hydrogen-ion concentration of many types of reactions has been widely studied during the past few years and these investigations have covered almost every field of chemistry. In the field of bio-chemistry a vast amount of work has been done and many interesting and valuable results have been obtained.

These p_H studies in the bio-chemical field have been almost entirely limited to water solutions; there are, however, many cases in which alcoholic extractions of vegetable or animal products must be made. The hydrogen-ion concentration is known to be a factor of great importance in aqueous solutions and must also be an influential factor in alcoholic solutions. These considerations have led to a study in this laboratory of the hydrogen-ion concentration of alcoholic solutions and tinctures.

It is known from the work of Lapworth, *et al.*[1] that stable and reproducible e. m. f. values could be obtained from concentration cells in which absolute to 98% alcohol was used as a solvent. They also used calomel half-cells made up with alcohol instead of water.

Bishop, Kittredge and Hildebrand[2] made a series of electrometric titrations of various acids and bases in alcohol as a solvent. They used $N/10$ NaBr half-cells made up with 95% and absolute alcohol. Smooth titration curves similar to those obtained when water is used as a solvent were obtained with the difference that there was a greater e. m. f. interval between the acid and the basic parts of the curve. This is due to the fact that the dissociation constant of alcohol is smaller than that of water. This difference in the dissociation products gives rise to a new and different system each time the concentration of the alcohol is changed. All these systems must have contact potentials which many investigators have practically ignored. The data accumulated by Lapworth, *et al.*[1] shows that these contact potentials cannot be ignored even over small changes in the water content of the alcohol.

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[1] *Jour. Chem. Soc.*, 99 (1911), 1417; 99 (1911), 2242; 101 (1912), 2249; 105 (1914), 2553 and 107 (1915), 1520.

[2] *Jour. Amer. Chem. Soc.*, 44 (1922), 135.

Any investigation of alcoholic solutions will of necessity involve many different concentrations, and it will generally be undesirable to determine the exact concentration of the solution at hand. The saturated calomel half-cell is very largely used in all types of p_H work and in this case has a peculiar advantage. Lapworth, *et al.*[1] in the fifth paper of their series have shown by the capillary electrometer method that the absolute potential of mercury in a saturated solution of a salt in any solvent is independent of the nature of the solvent provided that the ions present have all the same affinity for that solvent. They verified this by placing in contact a calomel half-cell made up with a saturated water solution of NaCl and a calomel half-cell made up with a saturated alcoholic solution of NaCl. They found that at the moment of contact there was less than one millivolt difference in potential between the two cells but due to diffusion and precipitation of the NaCl the contact voltage soon rose to between 6 and 15 millivolts. Since the alcoholic solution will be saturated with KCl at the interface it would seem probable that it is only the above contact potential which must be considered where a saturated calomel electrode is used.

This method was carefully checked on a set of 19 pairs of buffer mixtures made up according to the directions given by Clark.[2] One mixture of each pair was made up using water as a solvent and the other was made up so as to contain 50% alcohol by volume. The voltage of each of these buffer mixtures against a saturated calomel half-cell was determined at 25 ± 0.05° C. The calomel half-cell and tube for the solution under test were the same as described by Clark and Cohen.[3] This cell is constructed so as to reduce diffusion to a minimum, and the design also allows it and the solution to be immersed in a constant temperature oil-bath. When such a cell is not available the ordinary half-cell and an agar salt bridge may be used with equally good results.

It was found that the alcoholic buffer solutions gave stable readings which were reproducible within 1–2 millivolts. The e. m. f. of the alcoholic solutions was in every case higher than that of the corresponding solution made up with water as a solvent. The constant of the hydrogen electrode in alcoholic solution is unknown so that it is impossible to calculate the p_H from the results obtained. It is not convenient, however, to express the results in terms of e. m. f. and it has therefore become customary in this laboratory to calculate the results to p_H using the ordinary constants for water. When this is done in the case of the above buffer solutions it is found that the variation of the two members of the pairs is from 0.16 to 1.88 p_H units. The least variation was in the case of KCl-HCl buffer mixtures and greatest in the case of the phthalate-NaOH buffer mixtures. The results of the whole series suggest that the variation is less in the case of strong acids and greater in the case of weak acids, but it would require further investigation of a number of other acids to determine this.

The method used above was extended to a number of alcoholic tinctures. In determining the p_H of such materials it is very important to use a freshly plated

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[1] *Jour. Chem. Soc.*, 99 (1911), 1417; 99 (1911), 2242; 101 (1912), 2249; 105 (1914), 2553 and 107 (1915), 1520.

[2] "Determinations of Hydrogen Ions," 2nd Edition, page 106.

[3] "Studies on Oxidation—Reduction III," Reprint No. 834, from the *Public Health Reports* (May 4, 1923).

electrode which has been presaturated with hydrogen immediately before it is placed in the sample to be investigated. The voltage of the electrode will usually come to a stable reading in 5–15 minutes and remain there for 15–20 minutes or even longer. After this time the electrode usually starts to poison and the voltage drops off. The p_H is calculated from the maximum voltage. There is every indication that this maximum point is of real significance since it can usually be checked within 5 millivolts and when it is considered that these solutions are known to slowly poison the electrodes, this would seem to be good agreement. There are occasional samples which poison an electrode so rapidly that no stable reading can be obtained. The reason for this is still unknown for in all such cases the sample had the same history as others which did not poison the electrodes.

The p_H of tinctures of digitalis, aconite and strophanthus have been determined and found to have the following values.

Tincture of digitalis U. S. P.	5.12–5.77
Tincture of aconite U. S. P. VIII	5.20–5.51
Tincture of strophanthus U. S. P.	5.43
Tincture of ergot (U. S. P. X)	4.97

The p_H of several tinctures of aconite which were known to have been made with acid menstruums were determined and found to have values between 2.32 and 4.53.

Conclusions.—A method has been developed for determining p_H in alcoholic solutions using only the set-up common to most laboratories making such measurements on aqueous solutions which will give stable and reproducible values. Such a method should find wide use in any investigation of the alcoholic extractions or changes in the stability of the tinctures obtained. Some results obtained with tinctures of digitalis, aconite, strophanthus and ergot are given.

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THE EFFECT OF VARIOUS COMPOUNDS ON THE RATE OF DEVELOPMENT OF RANCIDITY IN FATS AND OILS.*

BY WILLIAM J. HUSA** AND LYDIA M. HUSA.

In a previous article (1) by the present authors it was shown that benzoic and cinnamic acids have no effect on the rate of development of rancidity in lard. This work has been extended to other substances.

EXPERIMENTAL METHODS.

The Kreis test (2) was used for detecting rancidity, the odor of the test samples serving as a confirmatory test. The tests were carried out as follows:

Five-cc. portions of oil of sweet almonds, with and without added substances, were placed in special 30-cc. Pyrex glass-stoppered test-tubes, with graduations at the 5-, 10- and 15-cc. levels for convenience in adding the reagents in the Kreis test. The tubes were placed in a water-bath at about 60° and held at this temperature for one hour, with occasional gentle agitation. They were then placed in a rack in a north window. After intervals of one week and two weeks the odor was noted and the entire sample then used in making the Kreis test.

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* Presented before the Scientific Section, A. PH. A., St. Louis meeting, 1927.

** Professor of Pharmacy, University of Florida.

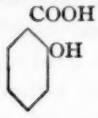
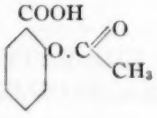
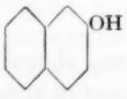
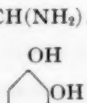
To carry out the Kreis test, 5 cc. of strong HCl (sp. gr. 1.19) was added and the tube shaken vigorously for about 30 seconds. Then 5 cc. of 0.1% solution of phloroglucin in ether was added and the tube shaken as before. If the oil has become rancid, a pink or red color appears in the acid layer, the depth of the color being dependent on the degree of rancidity.

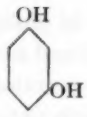
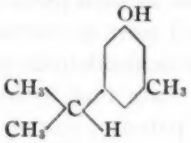
Oil of sweet almonds has an advantage over lard in tests of this kind, in that the solubility of the added substance may be noted. In each case 0.5% of the added substance was employed.

It is possible that certain substances may interfere with the Kreis test by increasing or decreasing the shade of color. An example will best illustrate our method of detecting such effects. Thus a sample of oil of sweet almonds from a freshly opened can gave a colorless Kreis test, which indicated that there was no trace of rancidity. The same oil with the addition of 0.5% salicylic acid also gave a colorless Kreis test. Another sample of oil of sweet almonds from a can which had been opened a few months gave a light pink Kreis test, which indicated that the oil was very slightly rancid. This oil with the addition of 0.5% of salicylic acid gave the same shade of light pink in the Kreis test. These results showed that salicylic acid did not interfere with the Kreis test.

EXPERIMENTAL RESULTS.

The results obtained, using oil of sweet almonds, were as follows:

Substance.	Effect on Kreis test.	Effect on rate of development of rancidity.
Salicylic acid 	None	None
Acetylsalicylic acid 	None	None
Beta-naphthol 	None	None
Liquefied phenol	None	None
dl-Alanine $CH_3CH(NH_2).COOH$	None	None
Pyrogallic acid 	Interferes by preventing appearance of color	None (judging from odor)
Hydroquinone	None	Reduces rate of development of rancidity

Resorcinol		Interferes by preventing appearance of color in a slightly rancid oil	None (judging from odor)
Thymol		Color slightly increased	None

The results obtained with lard and hydroquinone were as follows:

Color Obtained in Kreis Test.

	After 1 week.	After 2 weeks.
Lard	Pink	Cerise
Lard + 0.5% hydroquinone	Light pink	Pink

DISCUSSION OF RESULTS.

Salicylic Acid.—According to Askinson (3), salicylic acid materially counteracts the tendency of fats to become rancid. Lewkowitsch (4) also lists salicylic acid as a preservative of fats. These statements were not substantiated by our experiments, which showed that salicylic acid has no effect on the rate of development of rancidity in oil of sweet almonds.

Acetylsalicylic Acid.—Acetylsalicylic acid has no effect on the rate of development of rancidity.

Beta-Naphthol.—Experiments were carried out with beta-naphthol, because of its reputed value as an anti-oxidant (5). It was found that beta-naphthol has no effect on the rate of development of rancidity.

Phenol.—Moureu and Dufraisse (6) have stated that phenol has a very feeble effect as an anti-oxidant. Our experiments indicate that liquefied phenol has no effect on the rate of development of rancidity.

dl-Alanine.—*dl*-Alanine has no effect on the rate of development of rancidity.

Pyrogallic Acid.—According to Moureu and Dufraisse (6), pyrogallic acid is one of the most active anti-oxidants. Judging from the odor of the test samples, pyrogallic acid has no effect on the rate of development of rancidity. The Kreis test could not be applied in this case because pyrogallic acid interferes by preventing the appearance of the color. This led to the question of whether the pyrogallic acid caused a change in the compounds having a rancid odor, or whether it simply interfered with the reaction with the Kreis reagent. To determine this, two 5-cc. portions of a rancid oil of sweet almonds were placed in glass-stoppered test-tubes and 0.1 Gm. of pyrogallic acid was added to one of the tubes. The tubes were then warmed at 50–60° for 5 or 10 minutes; after this time the rancid odor was the same in both tubes. This result indicates that pyrogallic acid will not remove the rancid odor from a rancid oil.

Since pyrogallic acid is an isomer of phloroglucin, which is used in the Kreis reagent, the question arose as to whether or not there would be a color reaction with a rancid oil if pyrogallic acid in ethereal solution was used in place of the ethereal solution of phloroglucin in making the Kreis test. Tests were made in

this manner and it was found that pyrogallic acid used in place of phloroglucin in the Kreis test gave a colorless acid layer with a slightly rancid oil and a light violet-blue color with a strongly rancid oil. Apparently the color reaction between the rancid compounds and pyrogallic acid is not as delicate as with phloroglucin.

Hydroquinone.—Hydroquinone in the proportion of 1 part to 100,000 parts is said to retard or practically prevent the oxidation of benzaldehyde by air at moderate temperatures (7). Moureu and Dufraisse (6) state that hydroquinone is one of the most active anti-oxidants. In a British patent granted to these investigators (8) the claim is made that the addition of hydroquinone to vegetable oils, such as linseed oil, prevents their turning rancid. Our experiments show that hydroquinone reduces the rate of development of rancidity in oil of sweet almonds. This result indicates that there is at least some basis for the patent claims of Moureu and Dufraisse. Further experiments were carried out by us to determine the effect of hydroquinone on the keeping qualities of lard. The results with the Kreis test indicated that lard alone after one week had reached the stage of rancidity which was reached by lard containing hydroquinone after two weeks. Evidently the addition of 0.5% hydroquinone to lard reduces the rate of development of rancidity about 50%. Further work will be done to determine whether this property of hydroquinone can be applied to the preservation of ointments in a practical way.

Resorcinol.—Resorcinol is said to be of value as an anti-oxidant in benzaldehyde (7) and in rubber (5), but according to Moureu and Dufraisse (6) its action is very feeble. Resorcinol interferes with the Kreis test by preventing the appearance of the color in a slightly rancid oil. Judging from the odor of the test samples, resorcinol has no effect on the rate of development of rancidity.

Thymol.—Smith and Wood (9) have found that thymol inhibits the oxidation of soaps. They have further reported that thymol retards the oxidation of cotton-seed oil and of fatty acids at elevated temperatures. In our experiments, under conditions more comparable to the usual storage of fats, thymol showed no effect on the rate of development of rancidity.

Effect of Metals.—Emery and Henley (10) have shown that metals hasten the development of rancidity in fats. It has commonly been considered that access of both light and air, as well as traces of moisture, is necessary for the development of rancidity in a fat. But Emery and Henley showed that if the fat is in contact with metals, rancidity will develop even if light is excluded.

In our experiments on the effect of metals, 5-cc. portions of oil of sweet almonds in glass-stoppered Pyrex test-tubes were stored for two weeks in a dark cupboard. In some of the tubes, a strip of sheet metal was immersed in the oil. In two weeks, there was no development of rancidity in the oil of sweet almonds alone, or in the oil of sweet almonds in contact with aluminum. The oil in contact with a strip of tinned iron gave a pink color in the Kreis test after two weeks, compared with a barely perceptible pink tinge at the beginning of the experiment. This result indicates that tinned iron accelerates the development of rancidity. It should be noted, however, that the tinned iron strips gave a surface of tin on the sides and iron at the edges. The oil in contact with copper turned bright green and for this reason it was impossible to use the Kreis test in this case.

An experiment was also carried out to determine whether benzoic acid would

have the effect of counteracting the accelerating effect of tinned iron on the development of rancidity. The results indicated that 0.5% of benzoic acid does not alter the rate of development of rancidity of oil of sweet almonds in contact with a strip of tinned iron.

In addition to a further study of the effect of hydroquinone, it is our intention to investigate a number of other substances.

SUMMARY.

1. Hydroquinone reduces the rate of development of rancidity in oil of sweet almonds.

2. The addition of 0.5% of hydroquinone to lard reduces the rate of development of rancidity about 50%.

3. The following compounds have no effect on the rate of development of rancidity: salicylic acid, acetylsalicylic acid, beta-naphthol, liquefied phenol, *dl*-alanine, pyrogallic acid and resorcinol.

REFERENCES.

(1) William J. Husa and Lydia M. Husa, JOUR. A. PH. A., 15 (1926), 1071–4.
(2) Robert H. Kerr, *Ind. Eng. Chem.*, 10 (1918), 471.
(3) Askinson, "Perfumes and Cosmetics," page 277–8.
(4) Lewkowitsch, "Chemical Technology and Analysis of Oils, Fats and Waxes," vol. 2, 5th Edition, p. 792.
(5) N. A. Shepard, Stanley Krall and H. L. Morris, *Ind. Eng. Chem.*, 18 (1926), 615–20.
(6) Ch. Moureu and Ch. Dufraisse, *Compt. rend. soc. biol.*, 86 (1922), 321–3; through *Chem. Abstr.*, 16 (1922), 1439.
(7) Benjamin T. Brooks, *Ind. Eng. Chem.*, 18 (1926), 521.
(8) C. Moureu and C. Dufraisse, British patent 181,365, June 7, 1922.
(9) Otto M. Smith and Robert Eri Wood, *Ind. Eng. Chem.*, 18 (1926), 691–4.
(10) J. A. Emery and R. R. Henley, *Ind. Eng. Chem.*, 14 (1922), 937.

COLLEGE OF PHARMACY,
UNIVERSITY OF FLORIDA,
GAINESVILLE, FLORIDA.

SERTÜRNER MEMORIAL.

A memorial plaque was recently unveiled in the medical clinic of Münster in honor of F. W. A. Sertürner, pharmacist of Eimbeck, the discoverer of morphine, who was born near Paderborn, Westphalia, Germany), in 1783.

SMITHSONIAN SCIENTIFIC SERIES.

The Smithsonian Institution has engaged to prepare a series of twelve books to be known as the "Smithsonian Scientific Series," under the general editorship of the acting secretary. It is the purpose of the series to give pictures of the activities of the whole institution and its branches. The publication is not intended for the specialist nor in any sense is it a collection of monographs, but is rather intended to present those features of the greatest interest to the average intelligent reader with no special training along technical lines. It is expected that the individual books of the series will come out at various intervals during the next two years.

STATE UNIVERSITY IN BRAZIL.

The Rio de Janeiro correspondent of the *Journal of the American Medical Association* writes that the President of the Minas Geraes[1] has signed the law creating a state university. This will include at first four colleges, namely, law engineering, medicine and odontology and pharmacy. The medical school will have an annual endowment of 600,000 milreis (about $72,000).

[1] One of the States of the United States of Brazil.

CARE OF ANIMALS FOR BIOLOGIC ASSAYS.*

BY PAUL S. PITTENGER.

The accuracy of the biologic test to a marked degree depends upon maintaining the health and vigor of the test animal.

In most laboratories all of the test animals are of necessity kept indoors. If animals are to be kept in a healthy condition indoors for a prolonged period, special care must be excercised in the construction of cages, feeding and the elimination of vermin.

If cages are improperly constructed they cannot be readily cleaned and become offensive and vermin ladened. All cages should, therefore, be so constructed that they may be readily cleaned, disinfected and sterilized. Animal rooms containing properly constructed cages can be easily cleaned and kept free from vermin.

When kept indoors some animals require special additions to their food.

White Leghorn Roosters for testing ergot, for example, are normally outdoor animals. When placed in indoor laboratory cages for a period of one year they require more than a mixed grain scratch feed. To be kept in a healthy condition, in addition to mixed scratch feed, they require growing mash, grit and charcoal.

Owing to the fact that they do not have the hard ground and gravel in which to scratch and pick for food, the nails and beak if not properly cared for will become abnormally long. The nails become so long and curved that it is difficult for the cockerel to walk or hold fast to the roost. The beak will grow until it is impossible for the cockerel to close its mouth or to eat. It is, therefore, necessary at regular intervals to clip the beak and nails with bone clippers.

Animals which are allowed but little exercise require less and ofttimes different food than those that receive abundant exercise. The dog, for example, is a carnivorous animal, and meat is his natural diet. When kept indoors, however, and allowed but little exercise, the cooling effect of vegetables is necessary to offset the over-stimulating effect of excessive meat eating.

It is not the object of this paper to treat in detail the methods of housing, breeding, raising and care of each individual laboratory animal, as books upon these subjects are available. Practically all of these books, however, consider the animal only in its natural environment. The author on the other hand has had considerable experience with the housing and care of laboratory animals. The object of this paper, therefore, is to describe simply and briefly the cages and methods which we employ at the present time for housing laboratory animals and keeping them in a healthy condition.

GENERAL PRINCIPLES.

The animal house or room should be so arranged that it will possess maximum comforts for the animals and conveniences for the attendant. It should be dry, cheerful, well ventilated, warm in winter, cool in summer and easy to clean and keep in a sanitary condition. The house or room should have plenty of ventilation

* Read before the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION, St. Louis, Aug. 1927.

but *care should be exercized to avoid drafts.* If possible arrange room so it will admit plenty of sunshine.

All cages should be made of metal in order that they may be easily washed, disinfected and sterilized. Cages for all kinds of laboratory animals should be equipped with removable metal trays. Sawdust should be placed in the trays to absorb all drippings. The trays should be emptied, washed and disinfected daily and sterilized at least monthly.

The sawdust removed from trays should be emptied into large galvanized iron ash cans *with lids.* Cans should be emptied and disinfected at regular intervals.

The room should be provided with a large metal sink in which the trays may be washed and scalded. Sinks should be equipped with hot water and if possible live steam. After washing and scalding the trays a small quantity of a non-poisonous disinfectant should be spread over the bottom and clean sawdust placed on top. The trays are then replaced in the cages. In the case of trays for guinea-pig or rabbit cages a bedding of hay should be placed on top of the sawdust.

If this procedure is followed a large number of animals may be kept in the laboratory without objectional odors or danger of vermin.

The cages should be "washed down" occasionally with an antiseptic solution and if live steam is available they should be sprayed with it at regular intervals in order to kill vermin which may be in the crevices, etc.

The animal room can be kept free from roaches, etc., by dusting a mixture of Sodium Fluoride 50% and Sodium Borate 50% into all cracks along the bottom of all partitions, under cages, etc.

All food outside of the cages should be kept in closed metal containers in order that it will not attract rats, mice and other pests.

If the animal house is on the first floor without a basement underneath, the floor should, if possible, be made of asphalt or cement. If a board floor is used it should be built far enough above the ground and with openings large enough to permit small dogs and cats to go under after rats.

CAGES.

Practically all cages should be of all-metal construction. It is more economical, however, in the case of extra large cages to build the framework of wood and make the trays, partitions, doors, etc., of metal. Several coats of aluminum paint should be applied to the wooden parts of such cages to prevent the absorption of moisture. All cages may be more or less of the same general design. Four different size cages usually suffice for the animals required for biologic assays. These may be divided roughly into small, medium large and extra large.

The author usually designs and builds special cages to suit the particular room in which they are to be used. The stock cages, however, shown in Figs. 1, 2, 3, 4, 5 and 6, built by Geo. H. Wahmann Manufacturing Co., 520 W. Baltimore St., Baltimore, Md., are very satisfactory for practically all purposes.

Small Size Cages.—The small cages shown in Figs. 1 and 2 are of suitable size for housing four or five guinea-pigs or rats. This size cage is also suitable for holding one rabbit or one small cat while under test.

Medium Size Cages.—The cages shown in Figs. 3 and 4 are of a very serviceable size. Each unit is large enough to house 25 guinea-pigs or rats, one small dog,

five small or three large rabbits, three small or two large cats. This size cage is also very satisfactory for holding one or two roosters during the test period.

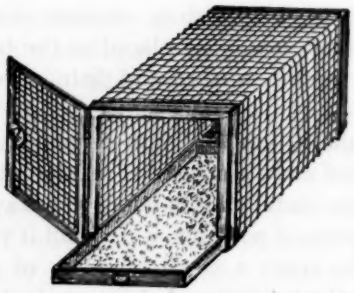


Fig. 1.—*Small Size Cage.*—Dimensions 9″ x 15″ x 9″ high. Made of heavy wire mesh 3 holes to an inch. No. 18 wire. The pan inside is heavy galvanized iron. The cage may also be equipped with a holder for water bottle the same as shown in Fig. 2.

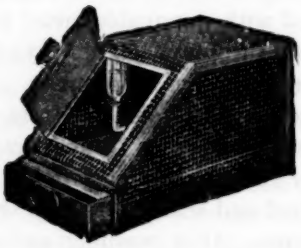


Fig. 2.—*Small Size Cage.*—Dimensions 9″ x 9″ x 15″ deep. Made of galvanized American ingot iron, and galvanized wire cloth. Galvanized iron drawer is removable for cleaning. Provided with water-drinking fountain and holder.

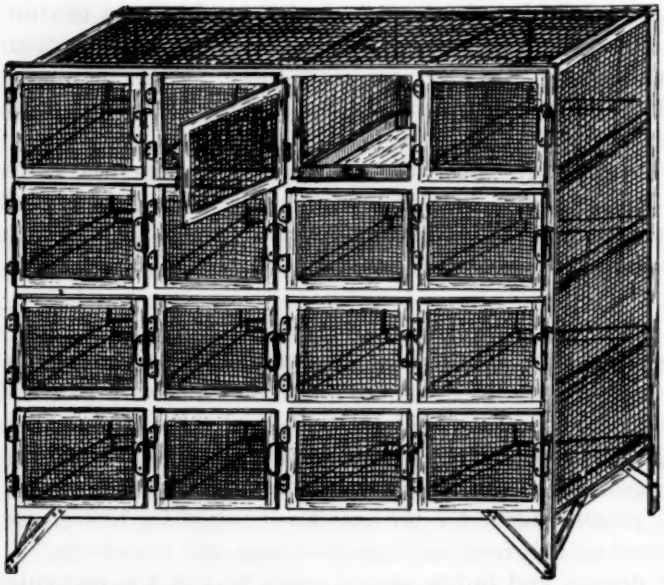


Fig. 3.—*Medium Size Cages.*—Each unit of this cage measures 22″ x 20″ x 14″ high. Made of heavy galvanized iron and stout wire mesh on a frame of angle steel. A cage of this type may be built so that it consists of 4, 8, 12 or 16 units. The galvanized iron trays are removable for cleaning.

They are, however, too small for housing roosters or dogs for longer than the test period.

Large Size Cages.—Cages of the size shown in Figs. 5 and 6 are satisfactory for housing one large or two small dogs, three or four large cats, five or six rabbits or two roosters. The cage shown in Fig. 5 is made with solid sides and back, two stories high. It may be made as many cages to the row as desired.

The cage shown in Fig. 6 is constructed with a removable wire floor and tapered bottom for collection of urine for metabolism experiments. Solid galvanized iron extends to one half the height of the sides and door inside to insure the collection of all urine voided. This also prevents dirt from the

upper cage from falling into the lower cage. Two hooks are soldered to the bottom, one on either side of the outlet, for attaching the specimen collecting bottle.

Extra Large Cages.—The two-story cage shown in Fig. 7 was designed by the author for housing roosters, dogs, cats, rabbits or guinea-pigs. Each unit of the cage measures 48″ long x 30″ wide x 30″ high. The framework is made of 2″ x 3″ white pine planed on all four sides. The sides, doors and fronts are made of perforated black iron. The door frames and supports are of 1″ angle iron. The trays are made of heavy galvanized iron supported by three pieces of 1″ angle iron. The angle irons are the only means of support for the trays. When the trays are removed, therefore, all dirt may be swept through to the floor. The cages may thus be easily and thoroughly cleaned. The twelve units of the cage are separated from each other by means of sliding removable partitions *A* made of perforated black iron in a frame of heavy galvanized iron. All metal parts are painted with aluminum paint to prevent rusting. The removable partitions make it possible to divide the cage into any desired number of units from two to twelve. In other words it may be made into two very large cages, four extra large cages or six, eight or twelve large cages, depending upon the number and kind of animals to be housed. It is better to house six to eight roosters or three or four dogs in two units (without partition between) of a cage of this size than to house one or two animals in smaller cages. By using two units as one cage the animals have plenty of room for exercise and are, therefore, healthier than when each animal is placed in a smaller cage.

Fig. 4.—*Medium Size Cage.*—This cage is of a slightly different construction than that shown in Fig. 3. This type cage was originally constructed for housing cats, but its peculiar construction makes it satisfactory for all small animals, even small dogs. This cage may be made with as many units as desired. Each unit is 22″ wide, 20″ deep and 15″ high. The four units of the cage shown above are supported by a stand made of heavy angle iron. A solid galvanized iron shelf is placed between each cage to prevent dirt from the cage above dropping into the cage underneath.

The removable partitions are especially convenient for ergot and cannabis assays for isolating animals during the fasting and testing period. At the beginning of the fasting period all of the roosters may be driven into one of the two units and the partition inserted. The other tray is then emptied and supplied with fresh sawdust. The cocks to be

fasted are placed in this unit. This procedure precludes the possibility of obtaining scratch feed from previous feedings which may be mixed with the sawdust. All mash hoppers must of course be removed or covered. During cannabis assays the perforated metal partitions are replaced by solid partitions, so the animals cannot see each other.

The galvanized iron forms *B* are used to cover the space between two trays when a partition is removed.

Figure 8 shows a very serviceable three-compartment galvanized iron hopper for holding growing mash, grit and charcoal for cockerels and a hay rack for placing in cage with guinea-pigs, rabbits, etc.

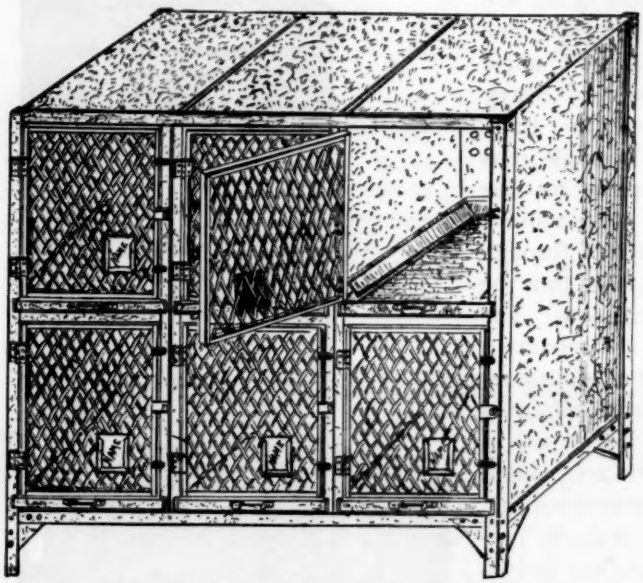


Fig. 5.—*Large Size Cage.*—This cage is specially designed for dogs but is of a very convenient size for cats, rabbits or roosters. Each unit measures 32″ x 34″ high x 31″ deep. Made of heavy galvanized iron throughout. The door is made of galvanized angle iron with very heavy galvanized iron diamond mesh.

CATS.

The cat is a mammal belonging to the order carnivera and, therefore, prefer to go in quest of their own prey and kill it.

All cats have the same general type of structure, the variations being only in minor characteristics which are very slightly related to their habits.

Cats are found all over the world except in Australian regions, Madagascar and the West Indies. They are tropical and heat loving; a few specimens, however, are found in the far North. For example, the tiger in Asia and the Puma in America.

Varieties.—The domestication of the cat occurred at a very early period. The first indication of its connection with man is found in the ancient monuments of Egypt, Babylon and Nineveh.

The *long-haired cats* include the various families known as the Indian, Chinese, Angora and the Persian.

The *short-haired or western cats* include several varieties which are based mostly upon color.

The common varieties include the tortoise shell, tortoise shell and white and the tabbies. The tabbies are divided into four classes: The brown, spotted, blue or silver and the red.

Short-haired cats are preferable for laboratory use.

Housing.—The cat as a rule is a very clean animal and when kept in the laboratory should be provided with means for remaining so. The sawdust in the

trays of the cat cages should be changed daily. Figures 3 and 4 show cages suitable for housing cats.

Exercise.—Animals which are kept for a prolonged period should be provided with some means for exercise. It is good practice to keep several sections of a cage of the type shown in Fig. 7 for use as an exercising cage. Several animals

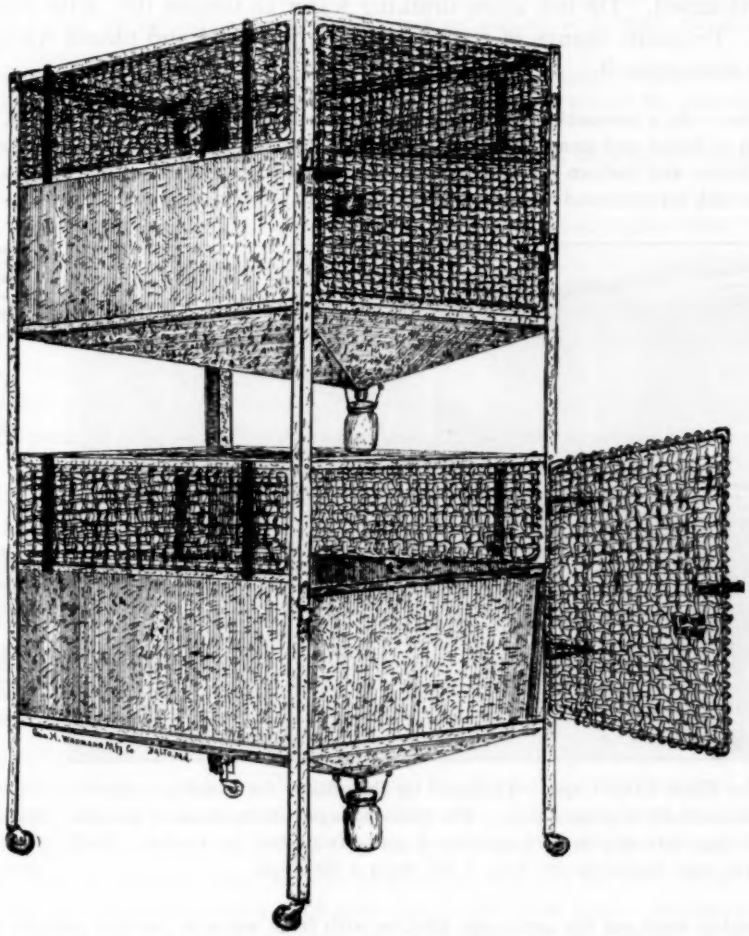


Fig. 6.—*Large Size Cage.*—The inside measurements of each cage are 22″ wide, 32″ deep, 22″ high. The framework is of heavy angle iron. The door and sides are constructed of very heavy special steel wire mesh made over a framework of pipe. The bottom, slanting pans and sides are of heavy galvanized iron. The framework is of one piece from bottom to top to insure rigid construction.

should be removed at a time from the small individual cages and placed in the large cage for twelve to twenty-four hours.

Feeding.—The cat thrives best on a mixed diet of milk, meat, fish and vegetables. If fed too much meat or fish it will refuse vegetables. It is best, therefore, to finely grind the meat or fish and vegetables and thoroughly mix so it will be impossible for the animal to separate the meat or fish from the vegetables. The

meat may be either raw or cooked. Animals with a limited amount of exercise, however, should not be given an abundance of raw meat. When fresh fish is not available, canned salmon may be used to advantage. Oatmeal porridge serves as a variation which is acceptable to most cats.

Water.—Water should be supplied in vessels that may be quickly and thoroughly cleansed. Do not allow drinking water to remain day after day without change. Frequent change of water should be provided and placed where the sun will not shine upon it.

Fleas.—As a precaution against fleas the cages should occasionally be washed down with a solution of Sanax and steam sterilized. The tray supports should be dusted with a mixture of Sodium Borate and Sodium Fluoride. If the animals became infected with fleas, spray the cages and room with kerosene and wash the animals in a weak solution of Sanax. Care should be taken

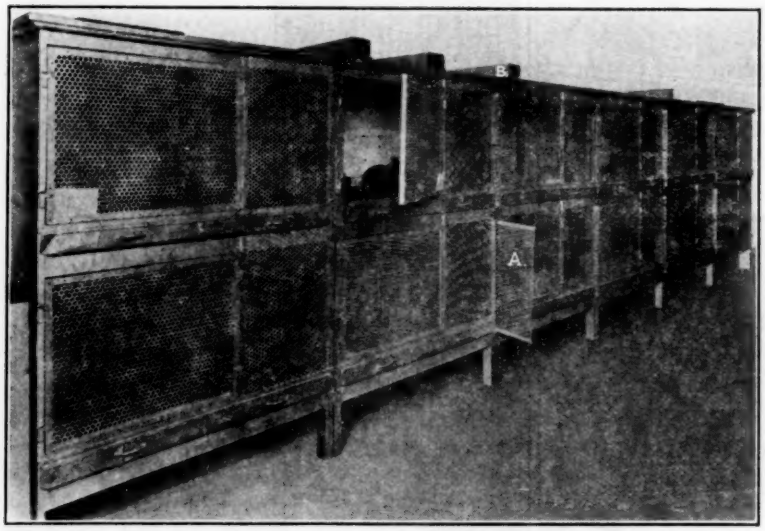


Fig. 7.—*Extra Large Cages.*—Designed by the author for housing roosters, dogs, cats, rabbits or guinea-pigs. The removable partitions make it possible to divide cage into any desired number of units from two to twelve. Each unit of the cage measures 48″ long x 30″ deep x 30″ high.

Fig. 8.—Three-compartment mash, grit and charcoal hopper and hay rack.

to thoroughly wash out the antiseptic solution with fresh water to prevent possible irritation of the skin.

Worms.—Are very often found in both the stomach and intestines of laboratory cats. The usual symptoms are those of intestinal irritation and the unthrifty appearance of the animal. The fur becomes harsh and dry and the abdomen distended.

The animal should be fasted for 12 hours and then given by mouth from $^1/_{10}$ to $^1/_4$ grain of Santonin with $^1/_4$ to 1 grain of Calomel depending upon the size and age of the animal. This should be followed after four to five hours with a dose of $^1/_2$ to 1 ounce of mineral oil administered by stomach tube.

Mange.—Two forms of this disease attack the cat, sarcoptic and follicular. Both are produced by a parasite which multiplies rapidly.

The ordinary or sarcoptic mange is due to a small parasite which burrows under the skin, where it deposits its eggs, which upon hatching become very irritating to the skin, as the young insects grow and tunnel out to the surface, where they breed for the next generation to burrow and deposit its eggs.

The sarcoptic mange may appear first on the face and cheek, or upon the insides of thighs and armpits, and may extend over the whole body. On account of the intense itching the animal will scratch itself, which produces abrasion, which scabs over and when scratched off becomes sores.

In follicular mange the parasite affects the nose around the muzzle, the skin of the chin and the skin of the paws, surrounding the claws, where it burrows in beside the roots of the whiskers and larger and grosser hairs, and into the sebacious glands. On examination around the roots of the whiskers and on the skin of the paws, we find dark red pimples or pustules about the size of a pin head.

A cat with mange should be separated from the other animals, washed with antiseptic soap or a weak solution of Sanax or other antiseptic solution and one of the standard mange remedies applied.

Other Common Diseases of the Cat include catarrh, distemper, pleurisy, pneumonia, bronchitis, constipation and diarrhœa.

Constant attention should be devoted to the prevention rather than the cure of these diseases.

DOGS.

In the case of dogs for laboratory use, attention should be paid primarily to cleanliness, feeding, exercise and affection.

Kindness runs strong in a dog's nature. All domestic animals are sensitive to the kindness of their owners and attendants, but no animal is so dependent upon human sympathy as the dog. Laboratory dogs may, therefore, be handled more easily by an attendant who is fond of and kind to the animals than by one who simply cares for them as part of his necessary daily tasks.

Varieties.—For *blood pressure work* any type or breed of dog may be satisfactorily employed. Usually, however, a common mongrel, short-haired, medium-sized dog is to be preferred.

For *testing Cannabis* medium-sized fox terriers are the best. If there are not any available, medium-sized, short-haired, long-legged dogs are preferable to long-haired, short-legged dogs.

Housing.—Dogs which are kept indoors should be placed in cages of the design shown in Figs. 5 and 7. Trays should be filled with sawdust and changed daily. If the animals are kept outdoors they should be provided with kennels. The kennels should be protected from rain and cold and should be ventilated from the top in order to prevent drafts. The animals should not be allowed to sleep on cement floors as cement is often cold and damp and will cause rheumatism and lameness. If the floor is made of cement a bed of straw should be provided and frequently changed. The kennel entrance should be from the side rather than from the front to safeguard against rain and wind. If possible shade should be provided in summer.

Exercise.—Small and medium-sized dogs such as used for laboratory purposes require plenty of exercise. If the dogs are not given sufficient exercise they overeat, become sluggish and ofttimes sickly.

If the size of the animal house permits, three or four dogs should be housed together in two or more units of a cage of the type shown in Fig. 7 rather than kept in individual cages of the type shown in Fig. 5.

In the large cage the dogs play and run and romp together thus getting plenty of exercise. If lack of space makes it necessary to house each dog separately,

one large exercising cage should be provided in order that the animals may be exercised in groups.

Feeding.—Dogs especially when kept indoors are better off a little hungry rather than overfed.

Feeding but once a day is the custom at most large kennels, but I consider twice a day much preferable. Twenty-four hours is too long a period for the stomach to go without food, and the animal so fed will usually bolt the food without proper mastication. This is one of the chief causes of indigestion.

Dogs should not be fed continually upon the same diet of cooked or raw meat, starchy food or corn bread. Dogs thus fed suffer from fermentative indigestion. No one food contains the necessary protein, fats and carbohydrates. A single meat diet creates a distaste for other and more varied foods. Do not feed such meats as pork, veal, etc. Feed beef, mutton and, occasionally, liver. Do not feed lights or offal from slaughtering.

If the dogs are fed twice a day dog biscuits are an ideal food for *the morning meal.* They should be fed dry For small dogs the biscuits should be broken into small pieces. Dog biscuits contain beef, cereals, ground bone and flour and, therefore, furnish a well-balanced diet. The hard biscuits provide exercise for the teeth and prevent bolting.

The evening meal should vary—otherwise it will become distasteful. Boiled vegetables, with meat should be fed during the summer months. Vegetables of all kinds except potatoes and corn (which are too difficult for a dog to digest) should be mixed with the boiled meat.

Soups that are not too greasy make excellent food and add variety to the diet. Dry broken bread or broken dog biscuits added to soupy food also adds variety.

In our laboratory we prepare the evening meal fresh daily. Small pieces of beef necks, flanks or butchers' scraps and bones are placed in a large pot and thoroughly boiled with plenty of water and a little salt. The bones are then taken out and a quantity of vegetables added and boiled to shreads. For variety the vegetables are replaced with rice, broken bread or dog biscuits.

Each dog is given some of the thoroughly cooked bone. This induces the dog to exercise his teeth and salivary glands while the small particles of bone gnawed off constitute nutriment to the bony structure.

Care should be exercised in the feeding of bones. Many dogs are injured by careless feeding of bones with sharp points or pieces which break off and are swallowed. Chipped bones are always dangerous. Small bones, such as chicken bones, splinter very easily and should never be fed as they are liable to cause trouble either by lacerating or puncturing the stomach or intestines.

Never let food stand around after meals. After the dog is through with its regular meals, remove all food, otherwise he will eat too often and too much.

Water.—Same as for cats. For dogs housed outdoors a pan placed under a dripping spigot makes an ideal dog fountain.

Fleas.—Same as for cats.

Worms.—If a dog has a ravenous appetite, does not seem to thrive and has a bloated appearance of the abdomen while thin elsewhere treat it for worms in the same manner as described for cats.

Mange.—Same as for cats.

Lice.—Lice cause great irritation which causes the animal to scratch and worry constantly. They live on all or any part of the body, but are usually most abundant about the head and face, the eyes, roots of ears and along the top of the back where it is hard for the dog to get at them. By closely examining the animal's skin, red streaks and spots of blood will be seen where the louse has been feeding.

A mixture of 40% Sodium Fluoride and 60% Talcum dusted upon the skin will kill the lice. Lice may also be killed by washing the animal in a solution of Sanax or some similar antiseptic. Care should be taken to prevent the solution from coming into contact with the animal's eyes.

If the cages and animal quarters are kept clean and are frequently sterilized, the animals will be free from lice unless the lice are brought into the cages by "new animals."

Nails.—The lack of hard ground and gravel in which the animal may scratch results in an abnormal growth of the nails. This makes it difficult for the animal to walk. The nails should, therefore, be clipped occasionally with bone clippers. Care should be taken not to clip the nail too close to the toe as this will cause bleeding. By careful observation the extent to which the blood enters the nail can be seen and by carefully avoiding the cutting of this part, bleeding will not occur.

(*To be continued*)

REPORT OF CONTACT COMMITTEE ON TABLETS.

The contact committees of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association have submitted to the Food, Drug and Insecticide Administration, United States Department of Agriculture, an extensive report in which they have indicated the degree of accuracy within which properly manufactured medicinal tablets can be made under present-day manufacturing methods. The report includes also methods of analysis for the tablets.

This is the third report submitted by the committees to the department. The previous reports related to hypodermic tablets.[1] The present one, in addition to amendments to the previous reports, includes suggested tolerances for ten of the more common compressed tablets.

The Food, Drug and Insecticide Administration, which is charged with the administration of the Federal Food and Drugs Act, has stated that in its activities in connection with the enforcement of the law it will give careful consideration to the recommendations of associations of manufacturers of products subject to the act. In promulgating the report of the contact committees the department invites comment from manufacturers, distributors, prescribers and any others interested in the preparations involved.

The tolerances recommended by the contact committees are as follows:

Hypodermic Tablets.

Atropine sulphate	7.5 to 12%[2]	Morphine sulphate	7.5%
Cocaine hydrochloride	9%	Nitroglycerin	15 %
Hyoscine hydrobromide	7.5 to 12%[2]		

Compressed Tablets.

Acetanilid	7.5%	Codeine sulphate	9 %
Acetphenetidin and salol	10 %	Phenolphthalein	7.5%
Calomel	7.5%	Salol	9 %
Calomel and soda	7.5 to 10%[2]	Sodium bromide	7.5%
Cinchophen	7.5%	Strychnine sulphate	7.5 to 12%[1]

Complete copies of the report, including recommended assay processes for the various tablets may be obtained from the Food, Drug and Insecticide Administration, United States Department of Agriculture, Washington, D. C.

[1] See JOURNAL A. PH. A. for 1926, pp. 112 and 302. [2] Depending upon the grainage.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

PHARMACEUTICAL PREPARATIONS.

Anon
Preparation of 90 per cent paraffin emulsion
Farm. Tidende (1927), 478; through *Pharm. Weekbl.*, 65 (1928), 125

Bümming, G.
Tincture of arnica
Apoth. Ztg., 43 (1928), 88

Dhers, V.
Stabilization of medicinal plants in pharmacy
Bull. sci. pharmacol., 35 (1928), 45

François, Maurice
Estimation of chloral in syrup of chloral
J. pharm. chim., 7 (1928), 54

Gabel, L. F.
Color standard for tincture of cudbear
JOUR. A. PH. A., 17 (1928), 148

Gambetta, E.
Study of iodo-tannic acid from the standpoint of the preparation of the syrup
Boll. chim.-farm., 65 (1926), 33; through *J. pharm. chim.*, 7 (1928), 123

Kroeber, Ludwig
Fluidextract Plantago lanceolata
Pharm. Zentralh., 69 (1928), 84

Liverseege, J. F.
Syrup of tolu
Pharm. J., 120 (1928), 93

Van Den Driessen Mareeuw, W. P. H.
Sodium pyrophosphate, spirit of ethyl nitrite, spiritus saponatus and tincture of strophanthus
Pharm. Weekbl., 65 (1928), 117

Van Pinxteren, J. A. C.
Notes on galenical pharmacy
Pharm. Weekbl., 65 (1928), 104

Winkler, L. W.
Mercuric cyanide pastilles
Pharm. Zentralh., 69 (1928), 81

Zanotti, A.
Preparation of alcoholic tinctures
Boll. chim.-farm., 65 (1926), 385; through *J. pharm. chim.*, 7 (1928), 124

PHARMACOLOGY AND THERAPEUTICS.

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Cat-eye method for the assay of mydriatics and myotics
J. A. O. A. C., 11 (1928), 53

Aidin, R.
Irradiated ergosterol in rickets
Lancet (1928), 230; through *Pharm. J.*, 120 (1928), 153

Bachrach, Eudoxie
Combined action of strychnine and morphine on the nervous system of the fish
Bull. sci. pharmacol., 35 (1928), 15

Fraser, F. R.
Liver feeding for pernicious anemia
Lancet (1928), 185

Hichens, P. S., and Gibson, R. E.
Sodium nucleate in acute pneumonia
Brit. Med. J., (1928), 52

Hoskins, G., *et al.*
Effect of isoamylethyl barbituric acid on the pulse rate of the rat
J. Pharmacol., 32 (1928), 295

King, M. J., *et al.*
Physiological reactions induced by a alpha-lobeline
J. Pharmacol., 32 (1928), 241

Launoy, L.
Biological tests and the test for the amino-arsenic compounds in particular
J. pharm. chim., 7 (1928), 49

Munsell, Hazel E., and Black, Hilda
Assay of so-called cod-liver oil extract for vitamin-A content and calcifying properties
JOUR. A. PH. A., 17 (1928), 139

Rogers, Leonard
Hydnocarpates and iodides in leprosy
Lancet (1928), 74

Sandborn, L. T., and Marvel, C. S.
Local anesthetics derived from β-piperidyl carbinol
J. Am. Chem. Soc., 50 (1928), 563

BOTANY AND PHARMACOGNOSY.

Herail, J., and Melis, E.
Note on false sarsaparilla
Bull. sci. pharmacol., 35 (1928), 1

Kroeber, Ludwig
Pharmacochemical notes on German medicinal plants
Pharm. Ztg., 73 (1928), 123

Mathiesen, F. J.
Strophanthus seed of commerce
Pharm. Acta Helv., 3 (1928), 21

Nilsson, Henry
Raphid cells in Veratrum album L.
Farm. Rev., 27 (1928), 57

Pickering, Elizabeth
Causes of deterioration of strophanthus seed during storage
Jour. A. Ph. A., 17 (1928), 21

Schneiter, W.
Critical and experimental evaluation of Peru balsam
Pharm. Acta Helv., 3 (1928), 11

ANIMAL DRUGS.

Kam, Oliver, *et al.*
Isolation and separation of the active principles of the posterior lobe of the pituitary gland
J. Am. Chem. Soc., 50 (1928), 573

Winterfeld, K., and Roederer, H.
Determination of the iodine content of thyroid glands
Apoth. Ztg., 43 (1928), 132

BACTERIOLOGY.

Levine, Max, *et al.*
Effect of addition of salts on the germicidal efficiency of sodium hydroxide
Ind. Eng. Chem., 20 (1928), 179

Morel, A., *et al.*
Antiseptic action of peppermint oil and its principal constituents
Schweiz. Apoth. Ztg., 66 (1928), 80

Schmidt, S.
Reaction between toxin and antitoxin and its significance for physiologically active serums
Dansk Tids. Farm., 2 (1928), 25

ALKALOIDS AND GLUCOSIDES.

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Tentative methods for the determination of cocaine
J. A. O. A. C., 11 (1928), 49

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Tentative methods for the determination of alkaloids in ipecac
J. A. O. A. C., 11 (1928), 50

Anon
Tentative methods for the identification of alkaloids
J. A. O. A. C., 11 (1928), 53

Wollmann, Alfred
Emetine reaction of ipecac preparations
Pharm. Acta Helv., 3 (1928), 1

VOLATILE OILS.

Dalton, W. Goeffrey
Terpeneless lemon oil
Perf. and Ess. Oil Rec., 19 (1928), 7

Dyson, G. Malcolm
Odor and constitution among the aromatic mustard oils
Perf. and Ess. Oil. Rec., 19 (1928), 3

Huerre, R.
Remarks on the preparation, purification and analysis of pyrogenous oils
J. pharm. chim., 7 (1928), 58

Karsmark, Karl Algot
Method for the determination of volatile oils in drugs
Farm. Rev., 27 (1928), 45

Parry, Ernest J.
Medicinal sandalwood oil
Chem. and Drug., 108 (1928), 81

MISCELLANEOUS PLANT CONSTITUENTS.

Driver, J. E., and Trease, G. E.
Constituents of crude drugs. V Tannins and related substances
Pharm. J., 120 (1928), 148

OILS, FATS AND WAXES.

Anon
Estimation of vitamin A in cod-liver oil
Lancet (1928), 149

Clare, J. L. L., and Svames, K. M.
Fat-soluble vitamins A and D in cod-liver oils
Lancet (1928), 150

Dickhart, W. H.
Behavior of fish oils with uranium nitrate and pyrogallol
Oil Fat Ind., 4 (1927), 326; through *J. Soc. Chem. & Ind.*, 47 (1928), 130B

Milani, C.
Determination of the purity of olive oil
Ann. chim. applicata, 17 (1927), 589; through *J. Soc. Chim. & Ind.*, 47 (1928), 130B
Simmons, W. H.
Specifications for waxes used in toilet preparations
Perf. & Ess. Oil. Rec., 19 (1928), 11
Volmar, Y., and Samdahl, Bj.
Determination of oleic acid in oils and a new method for the determination of the bromine value
J. pharm. chim., 7 (1928), 106

GENERAL AND PHYSICAL CHEMISTRY.

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J. A. O. A. C., 11 (1928), 51
Dörzbach, E.
Preparation of finely divided zinc oxide for ointments
Pharm. Ztg., 73 (1928), 93
Hamy, A.
Schlagdenhaufen's reaction for magnesium
Ann. fals. 20 (1927), 19; through *J. pharm. chim.*, 7 (1928), 73
McCay, LeRoy W.
New method for separating arsenic from antimony
J. Am. Chem. Soc., 50 (1928), 368
Meyer, Walter
Occurrence of selenium in sodium sulphate and zinc sulphate of the German Pharmacopœia
Pharm. Ztg., 73 (1928), 94
Van Den Driesen Mareeuw, W. P. H.
Hypophosphite reaction of arsenic
Pharm. Weekbl., 65 (1928), 70

ORGANIC CHEMICALS.

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J. A. O. A. C., 11 (1928), 48
Anon
Tentative method for the determination of arsenic in methylarsenates
J. A. O. A. C., 11 (1928), 49
Anon
Tentative method for the determination of pyramidon
J. A. O. A. C., 11 (1928), 51
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Tentative method for the determination of alkalinity or acidity of silver proteinates
J. A. O. A. C., 11 (1928), 53
Contardi, A., and Cazzani, U.
De Mythenaere's index for the determination of the toxicity of the arsphenamines
Boll. chim.-farm., 65 (1926), 513; through *J. pharm. chim.*, 7 (1928), 126
François, Maurice
Estimation of medicinal tannins by means of chrome hide powder
J. pharm. chim., 7 (1928), 114
Dougherty, Greg
Preparation method for benzophenone
J. Am. Chem. Soc., 50 (1928), 571
Palmer, Charles S., and Scott, Albert B.
Pure arsenobenzene and the molecular complexity of arsenobenzene and arsenomethane
J. Am. Chem. Soc., 50 (1928), 536
Kogan, Gregor
Soluble calcium glycerophosphate and some glycerophosphates
Pharm. Zentralh., 69 (1928), 49
Kunz-Krause, Herman
Yellow liquid paraffin containing added coloring matter
Apoth. Ztg., 43 (1928), 181
Rae, J.
Estimation of hexamine
Pharm. J., 120 (1928), 71
Rheinboldt, H., and Schmitz-Dumont, O.
Nitrosyl chloride and ketones
Jour. A. Ph. A., 17 (1928), 134
Stas, M. E.
Disturbing influence of some salts on the precipitation of calcium tartrate
Pharm. Weekbl., 65 (1928), 107
Van Eck, P. N.
Quantitative estimation of aromatic aldehydes by titration with benzidine solution
Pharm. Weekbl., 65 (1928), 82
von Oettingen, W. F., and Ishikowa, Y.
Composition of a series of bismuth sodium tartrates
Jour. A. Ph. A., 17 (1928), 124

CLINICAL TESTS.

Chiray, M., and Cuny, L.
Colorimetric determination of the biliary salts in duodenal fluid
J. pharm. chim., 7 (1928), 97

GELATIN IN MEDICINE.*

BY GEORGE D. BEAL[1] AND ANDREW NEFF.[2]

HISTORY OF GELATIN.

The first extensive use of gelatin was during the French revolution. The French government, backed by the Academy of Medicine, supplied the poor with gelatin soups. Bulletins were issued which stressed the value of these soups and recommended their use in place of the prevalent beef teas, but this new product of the soup kitchens was viewed with some suspicion by the citizens.

At about this time a French gelatin manufacturer, named Gannal, decided to make use of his family in deciding upon the food value of gelatin. They endured for some time the gelatin with bread and water diets which Gannal prepared, then their health began to fail. Not understanding at that time the significance of unbalanced diets, these experiments necessarily led to unsatisfactory results.

The first scientific work of definite value was probably that of Carl Voit in Munich about the year 1870. Voit's conclusion, still applicable, was that gelatin always spares protein, and to a greater extent than either fat or carbohydrate. Gelatin is an incomplete protein, however, and hence cannot be used as the sole source of protein supply.

MANUFACTURE OF GELATIN.

Edible gelatin is prepared commercially by steam-cooking specially prepared bones or skin. The material is first thoroughly washed, then limed for some 30 or more days, rewashed, neutralized and heated in open vessels by means of steam coils. This process breaks down the original proteins, casein or collagen, into gelatin. After the gelatin solution has been concentrated, filtered and clarified, it is allowed to gel, and is then dried and ground to about 30-mesh. The final product contains about 12 per cent of water. The better grades of American edible gelatin easily conform to, and some of them exceed, the purity requirements of U. S. Pharmacopœia X.

GELATIN AMINO ACIDS.

Table I shows the amino acids found in the gelatin molecule and in the molecules of casein, gliadin, zein, hordein and prolamin (taken from Sherman's "Chemistry of Food and Nutrition").

The proteins have a slightly higher caloric value (an average of 5.65 Calories[3] per gram) than the carbohydrates (an average of 4.1 Calories per gram), due to their higher content of carbon and their lower content of oxygen. In other words, they are in a less highly oxidized condition than the carbohydrates. The fats are still less oxidized and correspondingly show a still higher caloric value (an

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[1] Assistant Director, Mellon Institute of Industrial Research.

[2] Knox Fellow, Mellon Institute of Industrial Research.

[3] Calorie when spelled with a capital "C" indicates the amount of heat necessary to raise 1000 grams of water from 0° to 1° C. When spelled with a small "c," the amount of heat necessary to raise one gram of water from 0° to 1° C.

average of 9.45 Calories per Gm.). These points are well brought out by Table II, also taken from Sherman's "Chemistry of Food and Nutrition."

TABLE I.

	Gelatin.	Casein (milk).	Gliadin (wheat).	Zein (corn).	Hordein (barley).	Prolamin (rye).
Glycine	25.50	0.45	0.00	0.00	0.00	0.13
Alanine	8.70	1.85	2.00	13.89	0.43	1.33
Valine	1.00	7.93	3.34	1.88	0.13	?
Leucine	7.10	9.70	6.62	19.55	5.67	6.30
Proline	9.50	7.63	13.22	9.04	13.73	9.82
Oxyproline	14.10	0.23	?	?	?	?
Phenylalanine	1.40	3.88	2.35	6.55	5.03	2.70
Glutamic acid	5.80	21.77	43.66	26.17	43.20	38.05
Oxyglutamic acid	0.00	10.50	2.40	2.50	?	?
Aspartic acid	3.50	4.10	0.58	1.80	?	0.25
Serine	0.40	0.50	0.13	1.02	?	0.06
Tyrosine	0.01	6.50	3.50	3.55	1.67	1.19
Cystine	0.31	0.50	2.32	0.85	1.55	?
Histidine	0.90	2.84	3.35	0.82	2.14	0.39
Arginine	8.22	3.81	3.14	1.82	2.89	2.22
Lysine	5.92	7.62	0.92	0.00	1.01	?
Tryptophane	0.00	2.20	1.14	0.00	1.05	Present
Ammonia	0.49	1.61	5.22	3.64	4.84	5.11
Summation	92.85	93.62	93.89	92.58	83.34	67.55

TABLE II.

	Heat of Combustion in calories per Gm.	Per cent of carbon.	Per cent of hydrogen.	Per cent of oxygen.	Per cent of nitrogen.
Sucrose (cane sugar)	3.96	42.1	6.4	51.5	0
Starch, glycogen	4.22	44.4	6.2	49.4	0
Butter fat	9.30	75.0	11.7	13.3	0
Gliadin	5.74	52.7	6.9	21.7	17.7
Casein	5.85	53.1	7.0	22.5	15.8
Gelatin	5.30	50.0	6.6	24.8	18.0

Glycine, the amino acid present in largest amount in gelatin, is one of the substances used by the body in detoxicating materials of the benzene type, such as phenyl acetic acid, phenols and cresols. According to A. P. Mathews[1] the formation of glycocholic acid in the bile may be a similar process, since cholic acid is decidedly toxic.

Alanine like glycine can probably be synthesized by the animal organism.

Lysine and proline are both necessary for the growth of animal organisms. When present in small amounts only, health can apparently be maintained, but growth is inhibited.

Tryptophane apparently cannot be synthesized by the animal organism, and its absence, as well as the absence of oxyglutamic acid from the gelatin molecule, put this protein in the incomplete class. Tryptophane is responsible for the formation of indol and consequently of indican in the indican test for putrefaction.

[1] "Physiological Chemistry," 4th Edition.

Tryosine is practically absent from the gelatin molecule, but this amino acid can apparently be synthesized from phenylalanine, which is a matter of introducing an hydroxyl group.

GELATIN AS A PURE PROTEIN.

Gelatin like many other proteins belongs to the "incomplete" class; *i. e.*, it cannot supply all the amino acids which the body requires (tryptophane and oxyglutamic acid are practically absent). However, as can be seen in the above table, it does contain a considerable variety of these acids.

It is of interest to note here that, since gelatin is prepared by simple hydrolysis of ossein or collagen (the proteins found in bone, tendon, etc.), in supplying these particular organs with amino acids, gelatin probably acts as a "complete protein." But while gelatin cannot meet all of the protein requirements of the body, Kirchmann[1] has shown that if 12 per cent of the bodily energy requirements are supplied by gelatin, the decomposition of body protein, or the requirement of other proteins as foods, is lessened by 27 per cent.

The amino acids present in the gelatin molecule are in a readily accessible form; *i. e.*, gelatin is a very easily digested protein.

GELATIN IN INFANT FEEDING.

Gelatin shows much promise as an infant food, especially as a milk diluent in infant formulas. Its use in this connection goes back many years. J. Alexander,[2] P. B. Hawk,[3] T. B. Downey,[4] believe that the rôle played by the gelatin is that of a protective colloid, modifying the curd formation of the casein during digestion. R. M. Washburn[5] and also L. S. Palmer and G. A. Richardson[6] find no evidence of such an action. Work that we have done in attempting to ascertain the part played by gelatin in enhancing the availability of cow's milk, has given nothing of clear value. While there is probably little or no influence of gelatin upon the size and rate of formation of casein curds, the texture of the curds formed is still an open question, and may be a matter of some moment. At the present time we are conducting some experiments in coöperation with the Children's Hospital of Pittsburgh and the Knox Gelatine Company, by means of which we hope to acquire pertinent information of dietetic interest.

Last summer we carried out some tests in which nine members of Mellon Institute subsisted for about one month on plain and gelatinated milks. With the exception of a small amount of fruit, no other food was taken. We were not able to draw definite conclusions as to the relative merits of plain and gelatinated milk from these tests; but it is interesting to note that, in spite of what would generally be considered a strenuous diet, these men all continued their work as usual, and all remained in perfect health throughout the test.

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[1] *Z. Biol.*, 40 (1900), 54.
[2] *J. Am. Chem. Soc.*, 32 (1910), 680–87.
[3] *Proc. Soc. Exptl. Biol. Med.*, 20 (1923), 269.
[4] *J. Metabolic Research*, 5 (1924), 145.
[5] *Vermont Agri. Expt. Station Bul.* (1916), 195.
[6] 3rd Colloid Symposium, 1925.

HEMOSTATIC ACTION OF GELATIN.

Gelatin has been used as a hemostatic agent in China and Japan since prehistoric days. Its use for this purpose has persisted in Europe and in this country, although occasional cases of tetanus developed early in the history of the treatment when improperly sterilized solutions were used hypodermically. Perhaps, also, the gelatin employed was an inferior, unsuitable product.

The rôle played by the gelatin as a styptic is still uncertain. There are those who claim that the action is due to the calcium content, as gelatin is sometimes spoken of as a calcium gelatinate. Others maintain that the action is attributable to some organic function of the protein molecule.

According to H. C. Wood,[1] partly digested gelatin or gelatose is just as effective a styptic as is gelatin itself. This finding seems to suggest that gelatin given by mouth is as effective (although slower) as gelatin given hypodermically, other conditions being equal.

In regard to the effectiveness of gelatin as a styptic, Grau[2] injected 25 to 40 cc. of a 10 per cent solution of Merck's sterilized gelatin, and noted an increase in the coagulability of the blood two to four hours after the injection. A maximum effect was reached ten to twelve hours after the injection. He found the degree of increased coagulability to vary in different experiments from 66 per cent to 85 per cent. The effect continued unabated for several hours.

A report of Vossmer is of unusual interest in this connection. He found in some thirty gelatin-fed cases of melena neonatorum (greater or less amounts of blood in the fæces of the new-born) a mortality rate of 8.8 per cent. A previous mortality rate was 61.3 per cent in some thirty cases.[2]

THERAPEUTIC USES OF GELATIN.

The therapeutic uses of gelatin in general include its use in cases of internal or external hemorrhage, as epistaxis, bleeding from hemorrhoids, gastric ulcer (180 cc. of a 10 per cent solution twice in 24 hours), and hemorrhage from the bladder. The latter is treated by injecting sterilized gelatin.

The subcutaneous use of gelatin is indicated in hemorrhages such as hematemesis, metrorrhagia, melena neonatorum, and the purpuric forms of the infectious diseases, and is contra-indicated only in acute nephritis and parenchymatous renal hemorrhage.[3]

GELATIN AS A BASIS FOR CAPSULES AND SUPPOSITORIES.

Pharmacists are all familiar with the use of gelatin in the preparation of court-plaster, capsules, suppositories, lozenges, disks, etc. Gelatin in sheet form, having an appropriate glycerin content, yields itself admirably to the mass production of flexible capsules, or pearls, for the administration of oily medicaments. The coating of pills with gelatin is too familiar to warrant discussion here.

The plain gelatin capsules digest readily, so liberate their contents in the stomach. Capsules treated with formaldehyde, the so-called enteric capsules,

[1] *Am. Med.* (May 3, 1902).

[2] *Deut. med. Wochschr.* (1910), No. 27.

[3] Sajous' "Analytic Cyclopaedia of Practical Medicine." It has been used subcutaneously, in the treatment of aneurisms (by Lancereaux and Osler).

however, do not digest until they reach the intestine, so that their contents are liberated farther down.

Glycerinated gelatin suppositories ($^1/_3$ gelatine, $^1/_3$ glycerol, $^1/_3$ water), nasal, urethral, rectal and vaginal, are used in large quantities. They are firm, yet contain relatively large quantities of water, in which can be dissolved various medicaments.

GELATIN IN ADULT DIETARIES.

Gelatin is used in the adult dietary primarily in the form of salads and desserts, making the many attractive dishes with which all are familiar. Its use in the manufacture of ice cream is practically universal; about 0.5 per cent of gelatin is used and gives the cream a smooth velvety texture. The great advantage of gelatin in special dietaries, especially those for use in hospitals, lies in the fact that it is a pure protein, of known caloric value, making it a simple matter to calculate formulas, readily assimilable, and easily combined with practically any other form of foodstuff, especially vitaminous foods of value in the various so-called deficiency diseases. The above-mentioned quality, that of adding attractiveness to dishes, is of particular importance in preparing special foods for invalids and convalescents, where, for psychological reasons, the appetite must be tempted in every way possible.

PITTSBURGH, PA.

PRESCRIPTION CLINIC.*

BY ADLEY B. NICHOLS.

An introduction is hardly necessary for this clinic, as it has been conducted often enough for most of you to know its plan and purpose. All prescriptions presented are authentic and have been collected during the past year from current files. Many of those obtained were duplicates or have been presented before, and a large number of those brought to my attention as incompatibilities seem to offer no trouble or difficulty when compounded just as written, no matter how many times they were tried. In other words it would seem to show undue carelessness on the part of the original compounder, either as to the method of procedure or the ingredients used in filling the prescription. Prescriptions are printed as written.

℞ 1	Tr. Aconit.	*f*℥*ii*
	Tr. Bellad.	*f*℥*i*
	Sod. Brom.	℥*i*
	Elix. Pepsin. et Bismuth *q. s.*	*f*℥*vi*
M ft. sol.		

In this prescription, the bismuth is immediately precipitated by the sodium bromide; in the form, however, of a very creamy milk, which readily stays in suspension upon shaking. All that is required is a "shake label."

℞ 2	Stront. Salicyl.	℥*iv*
	Sod. Bicarb.	℥*iv*
	Phenyl. Salicyl.	℥*ii*
	Elix. Aromat. *q. s.*	*f*℥*iii*

* Prescription Clinic of Section on Practical Pharmacy and Dispensing, A. PH. A., St. Louis meeting, 1927.

In the first place we have an excessive amount of solids to dissolve in the elixir and, secondly, a very decided effervescence develops, due to the strontium salicylate and the sodium bicarbonate. The solids should first be thoroughly powdered in a mortar, the elixir added and the effervescence allowed to cease before the product is bottled. In this manner the excess solid matter is finely enough divided to readily be dispensed with a "shake label." A slight coloration occurs from the salicylate as the preparation ages.

℞ 3	Antipyr.	
	Caff. Cit.	
	Quin. Bisulph. *āā*	gr. *viii*
	Sod. Salicyl.	gr. *xvi*
	Aquæ *q. s.*	ƒ℥*ii*

In this prescription we experience difficulty with the quinine bisulphate, which seems to be split up when it comes in contact with the sodium salicylate. The preparation at once assumes a milky appearance and almost immediately a coagulation occurs with the result that a gummy, sticky mass adheres to the bottom and sides of the container leaving a clear supernatant liquid. This difficulty may be overcome by using about ten grains of tragacanth, which acts as a suspending medium and prevents the gummy mass from separating for about a week, after which time small granular particles are formed throughout the liquid.

℞ 4	Pot. Chlor.	℥*i*
	Tr. Ferr. Chlor.	ƒ℥*i*
	Ac. Acetylsal.	℥*i*
	Glycer.	ƒ℥*ss*
	Aq. Dest. *q. s.*	ƒ℥*ii*

This is a prescription in which the pharmacist must understand the possibilities of a compound; when first prepared this one has the light yellow color which would be expected. However, after the preparation stands for a few hours, the acetyl salicylic acid splits up and the characteristic coloring of the salicylic acid with the iron is developed. It turns red and, finally, changes to a deep purple; in fact, almost black.

It is doubtful whether the physician would want a preparation of this type, as in all probability he doesn't realize what takes place. If it is to be dispensed, the customer should be reminded of the change which will occur.

℞ 5	Tr. Aconit.	♏ *xii*
	Tr. Bellad.	♏ *xxiv*
	Spt. Camph.	♏ *xxiv*
	Sod. Brom.	gr. *xv*
	Syr. Hydriod. Ac.	ƒ℥*v*
	Spt. Eth. Nit.	ƒ℥*iii*
	Aquæ *q. s.*	ƒ℥*iii*

A triple reaction occurs in this prescription. The spirit of nitrous ether liberates iodine from the syrup of hydriodic acid, giving an immediate red color. The iodine in turn decomposes the sodium bromide, liberating bromine, these reactions being accompanied by a continued and heavy ebullition of gas; finally, when the spirit of camphor is added, deep red droplets are immediately formed

and some of these settle to the bottom of the container while others form a ring on the surface of the liquid. The stopper is continually forced from the bottle and after a day or two the red color disappears and the preparation becomes practically colorless, the little color remaining apparently being due to the tinctures.

Here again a physician would undoubtedly not desire to have the prescription dispensed in its present form. If the spirit of nitrous ether is omitted, no reactions develop.

℞ 6	Sod. Salicyl	ʒ*iiss*
	Syr. Ferr. Iod.	*f*ʒ*ii*
	Digalin	*f*ʒ*ii*
	Aquæ *q. s.*	*f*ʒ*iii*

Here again we find the iron salicylate reaction giving the preparation a dark red color, but perfectly clear. There is no objection to dispensing the prescription in this form as the color is permanent.

℞ 7	Cocaine Alk.	gr. *xvi*
	Chloroform	*f*ʒ*i*
	Phenol	♏ *v*
	Ol. Amgdal. Amar. *q. s.*	*f*ʒ*i*
M ft. Sol.		
Sig.	♏ *iii* in ear every 3 or 4 hours.	

Here we have a remedy for the ear but the physician has mixed his oils and has written for *bitter oil of almond* when he really wanted the *expressed* oil.

℞ 8	Unguentine	ʒ *i*
	Add Chloroform	10%
M. Ung.		
Sig.	Apply.	

Can you imagine the sensation of applying this ointment to a burned area? One burn on another! What the physician really meant here was chloretone, which would undoubtedly give a much more desirable effect.

℞ 9	Ext. Cannab.	gr *v*
	Ac. Salicyl.	ʒ*i*
	Zn. Sulph.	ʒ*i*
	Pot. Sulphurat.	ʒ*i*
	Ol. Terebin.	*f*ʒ*ss*
	Cocaine Hydrochlor.	gr. *x*
	Collodium Flex.	*f*ʒ*i*
M. ft. Sol.		
Sig.	Apply over Spots.	

Do you recognize the several combinations contained in this prize? This must have been a prescription for one of our toe dancers, for first of all we find the two characteristic corn remedy ingredients, namely, extract of cannabis and salicylic acid, probably used here to remove some calloused spot. Then we recognize none other than our white lotion ingredients in the case of zinc sulphate and the sulphurated potassa, probably used to beautify the foot at the same time. A little oil of turpentine acts as a liniment to relieve the aches, the cocaine helps to cover up the entire situation and, finally, we wind up with flexible collodion, our corn remedy solvent.

Needless to say it is quite impossible to make anything out of the prescription as it stands. In this particular case the pharmacist was able to dispense the preparation by replacing the collodion with rose water.

OPERATIVE PHARMACY AND DISPENSING LABORATORIES,
PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE.

PRESCRIPTION PROBLEMS AND NATIONAL FORMULARY PROPAGANDA.*

BY P. J. KOLB.

Some prescription problems are due to chemical incompatibilities and others are related to more complex causes.

The following prescription was prescribed:

℞	Sodii Benzoatis	4
	Liq. Potassii Citratis	30.00
	Syr. Acid. Citric. *q. s.*	60.00

The excess acid precipitated the benzoic acid and an unsightly mixture was the result. When the solution of potassium citrate was slightly alkaline the simple syrup was dispensed, the prescription remained clear and the therapeutic effect was not changed.

Another prescription frequently prescribed is as follows:

℞	Tr. Opii Camph.	*f* ℥*iii*
	Aqua Laurocerasi	*f* ℥*iiiss*
	Syr. Pruni. Virg.	*f* ℥*iss*
	Syr. Tolu. *q. s.*	*f* ℥*iii*
M. *f* ℥*i*	Every three hours	

One day the doctor prescribed:

℞	Tr. Opii Camph.	*f* ℥*iii*
	Acid Hydrocyan. Dil.	*f* ℥*iiiss*
	Syr. Pruni. Virg.	*f* ℥*i*
	Syr. Tolu. *q. s.*	*f* ℥*iii*

As it was impossible to reach the physician without attracting undue attention, the prescription was filled as usual. Aqua Laurocerasai was dispensed and the physician was well pleased that the change was made without comment. Proper tact and good judgment is needed at all times when filling prescriptions.

In a survey of the "National Formulary"—the thoughtful pharmacist will find many preparations that may be presented for the busy physician's attention. The various Pepsin combinations are splendid vehicles. *Liquor Antisepticus* and *Liquor Aromaticus Alkalinus, Lotio Calaminæ* and a number of others deserve greater attention. A large number of N. F. preparations can easily be prepared with the laboratory facilities of the average pharmacist and they also offer good opportunities for the training of junior clerks and every pharmacist should endeavor to give his apprentice a chance for more laboratory work.

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* Section on Practical Pharmacy and Dispensing, A. PH. A., St. Louis meeting, 1927.

Perhaps the reason why proprietary preparations are so generally prescribed is mainly because pharmacists do not have the time or inclination to feature N. F. preparations, but if these formulas were more generally prepared and if the pharmacist would act as his own detail man, the "National Formulary" would become a more important part of pharmaceutical activity.

THE IMPORTANCE OF TEACHING COMMERCIAL PHARMACY IN OUR COLLEGES OF PHARMACY.*

BY WORTLEY F. RUDD.

The individually owned retail pharmacies in this country are right now having the hardest struggle in their history for even continued existence. My diagnosis of this condition is:

1. There are far too many retail pharmacies.
2. Cut prices and chain stores have a strangle hold on business.
3. The retail pharmacist who is now in business has in many cases very little sound business training and almost no training in the fundamental principles of economics.
4. His competitors who own the chains are competent business men who for the most part have large capital and who are not particularly interested in the ideals of the drug business but only in its profits.
5. The outside contacts which the average independent proprietor and his clerks make are rather meager, with a consequent narrowing of vision and sympathy.
6. Altogether the spirit among them is distinctly pessimistic.
7. Many men of great ability who know retail pharmacy and might help unravel some of its present entanglements, are tied body and soul by some sort of personal or financial obligations to interests that do not care about the independent store.

These men sometimes make a gesture that is regarded as having some promise of real help—and then—well, it was a gesture.

A glowing picture indeed! We are sick and need a doctor. Surely no one individual or small group can hope to apply all the remedies that are needed.

I have but one remedy to suggest in this paper; it is but one of many that must be offered. The colleges of pharmacy are partly to blame for the conditions as we have them to-day. As a group they have almost entirely failed to realize that the changing conditions in retail pharmacy have made imperative additions to pharmaceutical curricula. We have not trained our students to meet successfully the high pressure business competition that is now the order of the day. Nor have they provided for the cultural side of education and these two failures on their part have sent pharmacists out into the world unprepared in two of the three elements that are the *sine qua non* for successful pharmaceutical practice. An experience of some twenty-five years in a college of pharmacy has given me the

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* Read before Section on Commercial Interests, A. PH. A., St. Louis meeting, 1927.

temerity to suggest that the pharmaceutical curriculum of three years might well be almost equally divided among three fields:

(*a*) Education in pharmacy as a profession.

(*b*) Education in those cultural subjects which will enable the pharmacist to meet other professional men on a common social basis.

(*c*) Education in the *business* of pharmacy.

From the beginning of pharmaceutical education the first field has taken practically all the time of the curriculum and in many schools still monopolizes practically the whole of the three-year curriculum. Gradually, however, the other two phases are gaining recognition. It seems to me that the time is now right on us when it is imperative that the field of business training must have a prominent place in the curriculum if we are even to survive economically.

To train a man for his life's work in any line in which buying and selling are a major part of his duties, and then fail to train him in the principles which underlie success in this part of it, is a betrayal of the trust imposed in the colleges by students who present themselves to us for their pharmaceutical education.

MEDICAL COLLEGE OF VA.,
RICHMOND, VA.

COMMERCIAL TRAINING IN COLLEGES OF PHARMACY: WHY I OPPOSE IT.

BY FREDERICK J. WULLING.*

1.—Colleges of Pharmacy were organized to teach pharmacy and not trade. They replaced the apprenticeship method of teaching which included no business training. Pharmacy is still pharmacy and is professional, not commercial, in essence.

2.—I get around the country a great deal and nowhere have I found a demand from retail pharmacists, worth noticing, for trade courses in colleges of pharmacy.

3.—In my own College, students have attended, for thirty-five years now, a course on Law & Ethics which considers the legal and ethical aspects of business transactions. Prominent business men address the students frequently but no credits are given for attendance, which, however, is obligatory.

4.—The number of strictly professional pharmacies is increasing. These are not asking for commercial courses in colleges of pharmacy. Several ultra-commercial pharmacists have told me they would not give employment to pharmacists or graduates in any of their commercial departments even though they may have attended commercial courses in colleges of pharmacy.

5.—The more business-like anybody is the better off he will be whatever his profession, business or activity, but special business training is not essential to the practice of pharmacy. In cases where pharmacists want to carry on trade intensively, they can qualify by attending business colleges of which there are many good ones. It is true, though, that many of the ultra-commercial and successful so-called pharmacists have never attended business colleges. Graduates from colleges of pharmacy should have sufficient intellectual capacity to conduct their

* University of Minnesota.

professional practice in a business way. If they haven't, there are the business colleges whose specialty is business training. Professional schools should and do restrict themselves to teaching their respective specialties. For them to take on side-lines is questionable educational practice in my way of thinking.

6.—I have no quarrel with business. It is just as essential and respectable as any profession, but it isn't pharmacy and colleges of pharmacy should stay in their own yards and not graze in other pastures.

7.—The exploitation of pharmacy by trade is by no means universal and pharmacy has a better right to its own privileges and prerogatives in its own field than trade has. Ultra-commercialism is not only an infringement upon, but a wrongful invasion of pharmacy. It is certainly not within the functions of colleges of pharmacy to take any part in the development and stimulation of the exploitation of the profession of which they more than any other one factor are the mentors and the exemplars.

8.—It has already been abundantly established that trade is not the remedy for the ills of a large portion of present-day retail pharmacy, *but that it is the major cause of them.* The remedy is not more trade but a better regulation of the practice of pharmacy, including the careful and judicious restriction of the number of drug stores and better and stricter administration by the boards under the sanction of additional law in cases where present acts are insufficient, and by educative and associative work with the medical profession.

9.—The question can be fairly raised whether the charters of the several colleges of pharmacy authorize them to give business courses. Colleges of pharmacy established by legislative acts and colleges supported by State tax have no such power. I do not raise the question whether it is good ethics for them to give business instruction, but *it is clear in my mind that our Association was organized on the basis of higher pharmaceutical ideals and standards and not for the stimulation of what is squarely opposed to the highest professional standards.*

10.—Pharmacists have been made a special and privileged class by law for the purpose of affording the best and the most professional pharmaceutical service to the public. In the measure in which individuals engage in other and purely remunerative activities, they impair the good faith and expectation implied in their licensure. It certainly is not within the province of the colleges of pharmacy to countenance, much less to aid, this tendency toward a forgetting of obligations.

11.—Pharmacy should more fully realize that it is the chief and foremost and most extensive specialty and division of medicine and that only by living up to that high estate can it meet and discharge its obligations and responsibilities. Until pharmacy purges itself of every influence and contamination foreign to the strictly professional and service ideal which gave it its birth, it will not ameliorate or remedy its problems and difficulties. *To teach trade in colleges of pharmacy in order to increase trade in drug stores, is to aid in substituting the gain motive for the service motive, and without the latter, pharmacy cannot exist.*

12.—If our associations endorse more extensive business courses within their member colleges they will make a grave error and I want to go on record as strongly opposed to such a commitment. If the commercial invasion of pharmacy proceeds much further, it will bring an inevitable reaction that will result in a complete change in the personnel having charge of pharmacy at large. A profession is in

charge of its educators and practitioners. These are its trustees. Trustees who do not administer rightly are replaced by those who do. Trustees of a profession must be wholly professionally-minded. They must improve their trust and not weaken or debase it. The present trustees of pharmacy are on trial now. They are accountable to the present and future generations. The AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy are important associative trustees. They usually proceed most carefully and deliberately and constructively. For anyone to aid and abet the commercial invasion, would, in my judgment, amount to maladministration of our share of the trust.

THE ASSOCIATION, THE LAW AND THE PHARMACIST.*

BY J. H. BEAL.

One of the severest indictments that can be laid at the door of pharmacy to-day is that it contains so large a class of men who must be argued with in order to convince them that they should support their state and national associations.

As long as the personnel of pharmacy includes any considerable proportion of those who do not instinctively and spontaneously recognize the duty of loyalty to the organizations which represent them in their collective vocational capacity, just that long will pharmacy lack the professional spirit and cohesive sentiment necessary to give it an honorable place in public estimation.

It was said by Lord Bacon that "Every man who engages in the exercise of a profession enters into a tacit understanding with his brethren to maintain its honor and dignity."

The pharmacist who is not a member of his professional organizations in effect denies the honor and dignity of his vocation, and has no ground of complaint if the public follows his example. Those who evidence no respect for their vocation cannot expect others to do so.

The druggist who complacently accepts the benefits of the state association's efforts without contributing to its support is a business hobo living at the expense of better men than himself. Were all other considerations lacking, the constant menace of injurious or even destructive legislation which can be successfully combated only by concerted effort should be full and sufficient justification for all the support which the state and national associations ask of the retail druggists.

If the associations have not reached the state of efficiency they should possess, the failure should be charged to lack of proper support from those whom they are striving to serve. Only those can consistently criticize them for lack of efficiency who have made an honest effort to make them better.

Some members have most extravagant ideas of what their state association should be able to accomplish with very insignificant financial resources. They are as hard to please as the small boy in the candy shop. After the boy had looked at all of the candy in the show-case the clerk asked, "Do you expect the earth with a red ribbon around it for a nickel?" And the small boy said, "Let me see it."

* From an address to the W. Va. State Pharmaceutical Association, June 22, 1927.

With an appreciation of values similar to that of the small boy some druggists expect the associations to protect them against cut prices, prevent the enactment of vexatious legislation, effect the repeal of burdensome taxes, and establish a pharmaceutical millennium all in return for a contribution considerably less than the annual dues paid by a member of the hod-carriers' union.

Pharmacy will never come into its own until the average retail druggist, without prompting or urging, shall consider the support of state and national associations a matter of course and as much an established part of his business policy as the carrying of fire insurance or the keeping of a telephone.

The Multiplication of Laws Affecting the Practice of Pharmacy.—When the writer entered the drug business, somewhat more than fifty years ago, aside from a working acquaintance with the Ten Commandments, the only laws the Ohio druggist needed to be acquainted with were two brief statutes, one regulating the sale of poisons and another prohibiting the sale of abortifacient drugs, both of which were pasted on the inside cover of the Pharmacopœia for convenient reference.

In that ancient day when two or three druggists got together they invariably bewailed the dearth of pharmacy laws, and speculated upon how much higher the pharmacist would stand in public estimation, and how much more profitable his business would be, if there were laws regulating admission to the practice of pharmacy and prohibiting various things thought to be undesirable.

To-day, if all the laws and regulations of interest to the retail druggist were bound together they would make a volume considerably larger than that old 1870 Pharmacopœia. That the druggist of the present time finds many more occasions to know the provisions of the law than to know the text of the Pharmacopœia is no idle figure of speech but a plain statement of fact. From the syrups of the soda fountain to the items of the drug stock there is scarcely a transaction in the daily business of the drug store which is not the subject of some statute law or bureaucratic regulation, not merely requirements enforcing the genuineness and purity of drugs and their proper dispensing, but many useless and vexatious regulations relating solely to the petty details of bureaucratic administration.

A survey of various lines of occupation would probably show that no other calling or vocation has been so constantly plagued by unnecessary legislation, either accomplished or attempted, or so persistently heckled by meddlesome administrative orders as the drug business. No other merchant is required to take out so many licenses and permits, is subject to the regulations of so many bureaus, boards and commissions, or is required to pay taxes on so many items of his stock in trade as the dealer in drugs and medicines.

Not only for the present but for many years to come legislation will probably continue to be a subject to which the pharmacist will be forced to give serious attention, both in respect to that which he may justly seek on his own initiative and to the still larger volume which zealous reformers ever seem inclined to thrust upon him.

A Common Legislative Program Desirable.—In surveying the legislative situation one fails to discover anything like a common opinion in the various states as to the character of legislation which the pharmacists in all states might equally endorse. Not only is there a wide difference of opinion as to the kind and purpose

of legislation most necessary, but there is an equally wide divergence in the provisions of measures intended for the same purpose. Each state seems inclined to drive ahead on its own program regardless of what the program may be in other states.

Doubtless all of the separately proposed laws possess some measure of desirability, but the disparity of objects proposed indicates very plainly the lack of common understanding and the lack of coördinated effort which must somehow be reached if pharmacy is ever to make itself effective in a large way. Certainly each state should have the right to determine for itself what legislation it will adopt, but it should not ignore the advantages to be gained by utilizing the wisdom and experience of its sister states nor the advantage of having the laws upon the same subjects as nearly uniform as possible in all of the states.

The formulation of a proper statute involves something more than the simple hiring of an attorney to convert the suggestions of the legislative committee of a state association into legal phraseology. It needs the lawyer trained in the principles of statutory interpretation and constitutional law in order that the new statute may have the necessary legal validity; it needs the help of the political economist posted in the reactions of legislation in order that the statute may not fail through infringement of economic principles; and finally it needs the technical knowledge and practical experience of the man in business, in order that it may not be burdened with provisions incapable of practical application.

If a thorough and systematic study of the entire subject of legislation as related to pharmacy could be made by a body of representatives appointed for that purpose by the different state associations and meeting under the auspices of one of the national organizations, it would promote a common understanding as to the kind of legislation most desirable and work a great improvement in the character of measures presented to the state legislatures.

Such a common program of legislation would give a unity of action highly desirable, would stimulate the sense of common interest which pharmacy so much needs, would harmonize the efforts of state and national associations, and would save the N. A. R. D. the embarrassment of occasionally being called upon to simultaneously assist in the enactment of a particular measure in one state and to help defeat practically the same measure in some other state.

Some Unexpected Reactions of the Pharmacy Acts.—It is a matter of common observation that new legislation quite frequently fails to accomplish what was expected of it, and on the other hand, that it frequently gives rise to reactions entirely different from those which were anticipated or desired.

The original pharmacy acts were proposed upon the theory that the enforced examination of candidates for the practice of pharmacy was necessary to protect the public from the injuries likely to result from the dispensing of medicines and poisons by ignorant and otherwise incompetent persons. Although advocated for the protection of the public health, the general public was either indifferent to the measures, or in some cases altogether hostile to their enactment, and it was almost entirely due to the efforts of pharmacist proprietors that these laws were finally placed upon the statute books.

While the pharmacist advocates of these laws were no doubt sincere in the claim that they would result in great public benefit, nevertheless, the chief incentive

to the energy with which they advocated them was the belief that, as a collateral and incidental result, they would also be of immense benefit to the practice of pharmacy.

It was confidently believed that the enforced examination of candidates would admit men of first-class ability, that it would exclude the unworthy, and thereby so reduce the number of drug stores in proportion to population as to greatly enhance the dignity of pharmacy in public estimation and correspondingly improve the financial prosperity of its practitioners. In fact the druggists of that day confidently expected all the benefits from the pharmacy acts that are now expected to follow the requirements that all registered pharmacists be college graduates, and that all store owners be registered pharmacists.

How far have these expectations been realized?

That the average qualification of pharmacists is higher than formerly, and that the laws have resulted in the exclusion of many unqualified persons who otherwise might be engaged in the dispensing of medicines and poisons is beyond question, and in these respects the laws have justified themselves as measures primarily for the public benefit. That the other expectations of their advocates have been realized is not so clear.

In operation they have not reduced the number of pharmaceutical establishments in proportion to the population as it was hoped they would. On the contrary the existence of the laws has caused those on the outside to look upon pharmacy as a "protected vocation"—which it is not—and has increased their desire to share in the supposed benefits. If the laws have served to prevent the multiplication of drug stores to any extent, the possible benefit has been more than nullified by the transfer to other shops of the sale of articles of merchandise formerly sold exclusively in drug stores.

One reaction quite unexpected by the pharmacist proprietors who so vigorously advocated the enactment of the laws has been their effect upon the compensation of clerks and assistants, which since the choice of assistants is confined to a restricted list has been largely increased. Formerly the opportunity of learning his profession, and acquiring the experience which would make him a successful proprietor was considered to be a liberal part of the drug clerk's compensation; now he is one of the best paid among those who occupy clerical positions. The assistant pharmacist, therefore, has abundant reason to be satisfied with the operation of the pharmacy acts, though their wage-increasing effect was a result neither sought nor anticipated by the proprietors who were responsible for their enactment.

Another unexpected reaction of the laws has been a somewhat lessened opportunity of the enterprising pharmacist to establish a personal reputation for exceptional professional qualifications. When it comes to the filling of prescriptions the public is apt to reason that one store must be about as good as another, since the Board of Pharmacy will not admit to practice any except those who have proved themselves competent. If the prescriptionist is competent, what more can be asked?

For the pharmacist proprietor the pharmacy acts have if anything increased the competition which he must meet, have materially added to his cost of doing business and have not perceptibly improved either his professional prestige or his profits.

While no one would advocate repeal of the acts, a comparison of their antici-

pated with their actual results tends to make us somewhat skeptical as to the possible benefits to be derived from further restrictive legislation.

Unexpected Reactions of the Anti-Trust Laws.—Another illustration of the fact that legislation affecting trade relations is a remedy which should be handled cautiously is found in the Sherman Anti-Trust Act, the reactions of which have worked greater injury upon some of the interests which favored its enactment than upon the evils it was intended to reach.

The undoubted purpose of the Sherman Act was to prevent great aggregations of capital in the hands of a few men—the so-called Trusts—from acquiring monopolistic control of certain staple commodities by the simple process of radically underselling their competitors of smaller capital until the latter were driven out of business, after which the Trusts could quickly recoup their losses by again raising prices to a remunerative level. This the law sought to do by prohibiting certain forms of trust agreements, and by defining and prohibiting monopolistic combinations and practices.

The intention of the law was good but its application has been far from satisfactory to the class of small dealers who were most active in securing its enactment. Large capital owners soon found it possible to circumvent the language of the law by avoiding the prohibited forms of trust agreement and yet enjoy all the advantages of large capital control.

When labor held its mighty fist in the face of Congress, the latter quickly exempted labor combinations from the provisions of the Act. When agriculture with its tremendous voting strength made objections, agricultural combinations were likewise exempted. At the present time these two powerful voting groups may, if they like, meet in front of the Capitol at Washington and openly enter into combinations and agreements unlawful to all other citizens. And not only this, but we behold the executive department of the Federal Government actively urging agricultural interests to coöperate in the restriction of production for the definite purpose of increasing prices, which if attempted by united action of any weak voting group, such as shop-keepers or professional men, would subject them to all the pains and penalties of the anti-trust laws.

Furthermore, by interpretation the meaning of the law has been expanded far beyond anything that could have been in the minds of those who were most active in having it placed on the statute books—a meaning which makes it unlawful for men of small capital to combine for the purpose of doing what is perfectly lawful for men of large capital to do. For example, it is lawful for an individual or corporation owner of many stores to control prices in all the stores of the same ownership without let or hindrance. The single owner of many stores may lower prices to a point where his competitors can no longer remain in business, and thus acquire complete monopoly, or he may by a single order increase prices in all his stores without violating any law. But if the many independent dealers thus attacked should attempt to protect themselves by agreement with each other to do precisely the same thing which the large capitalist owner may lawfully do, they become an unlawful combination subject to fine and imprisonment. In other words, it is distinctly unlawful for small owners to agree with each other to do precisely the same things which the large individual or corporation owner may do with perfect impunity.

This, substantially, is the present state of the law under a government alleged to be based upon the principle of "equal rights to all; special privileges to none."

Numerous other examples might be cited of laws similarly disappointing in their results: of public utility laws and commissions which have become the strongest aids of public utility interests in their raids upon the public which the laws were intended to protect; of insurance laws and commissions ostensibly intended to secure open competition in rates between insurance companies, but which in fact have become the willing instruments of the combined insurance interests in preventing any reduction of rates by independent companies.

The further we carry our investigations the more evident it becomes that legislation is an uncertain remedy for trade or social evils; a remedy that misses about as often as it hits; and not infrequently misses the abuse at which it was aimed and hits the interests it was intended to benefit.

Sound Legislation Based on Fixed Principles.—Law-making is not a new subject of investigation; the world has been experimenting with it for some thousands of years, which experience has served to establish certain general principles the observance of which characterize the kind of legislation which can reasonably be expected to accomplish its object, and the non-observance of which marks the variety of legislation that is almost certain to fail. These principles, although familiar to the political economist and to the careful student of history, seem to be largely non-existent in the minds of those who constitute a majority of our state and national law-makers and in the minds of a majority of the reformers who inspire a large proportion of their activities.

Legislation Must Not Conflict with Natural Law.—The first principle of sound legislation and one which law-makers and reformers so frequently forget is that legislation intended to prevent or reverse the operation of natural or economic law cannot succeed. The history of civilization is filled with examples illustrative of this fact. Occasionally political action has seemed to prevail over economic law, but only temporarily: when the final account has been made up, the credit balance has always been on the side of economic law.

Man-made laws may be violently thrust into economic problems, but they cannot prevent the economic consequences which balance the equation. Political action may produce an artificial surplus of a commodity but it cannot prevent a corresponding fall in price; it can create an artificial scarcity, but cannot prevent the price from rising proportionately. Political action may increase the issue of a paper currency beyond economically safe reserves of specie, but all the powers of government combined cannot prevent a corresponding fall in the purchasing value of the fiat money.

A statute may prohibit under severest penalties acts growing out of the inborn qualities of human nature, but it cannot prevent these qualities from influencing the behavior and characters of men.

Physical structures can be erected according to exact specifications because physical materials may be lengthened or shortened, or shaped at will. Social structures cannot be constructed to meet the blue-print specifications of reformers and moralists because the fundamental qualities of human nature do not lend themselves to artificial manipulation.

The first requirement, then, of statutory enactments, whether relating to pharmacy or to any other division of the social structure is that they must be constructed to operate in harmony with natural law, otherwise they will fail, or will provoke reactions more intolerable than the conditions they are intended to correct.

Effective Legislation Must Represent Prevailing Public Sentiment.—Another principle many times confirmed by experience is that the only effective kind of legislation is that which represents the well-settled convictions of a substantial majority of the people who are to be controlled by it. In proportion as statute laws approach this standard they will be observed; in proportion as they recede from it they will be disobeyed. Perhaps we might go farther and say that frequent or general disobedience to a statute is nearly conclusive evidence that it does not represent the settled convictions of a substantial majority of citizens, and that it should be amended until it does represent them.

A properly effective statute does not of itself establish a reform but only marks the period when the reform has already become established in the minds and habits of all but that slender minority of citizens who do not willingly conform to the accepted standards and customs of the society of which they are a part, and to whom the method of compulsion must be applied.

Legislation Cannot Serve as a Substitute for Business Capacity.—Legislation can facilitate business or retard it; it can divert business from the establishment where it would naturally go to the establishment it would naturally stay away from, but in the true sense it cannot create business, nor compensate for lack of business capacity.

Brown owns a store on the North side of a street and being a competent and enterprising business man, builds up a prosperous trade. Jones owns a store on the South side of the same street, but lacking business capacity or not exercising good business judgment either fails altogether or makes only a bare living.

The law was the same on both sides of the street but the men were different. The failure, however, believes that if the law had contained some additional provisions his own success would have been greater and that of his competitor would have been less.

If the law be equal to all, either in distributing favors or in imposing handicaps, the man with the best business judgment and with the most enterprise and industry will always win over the man who possesses these essential qualities in less degree.

Legislation which has no higher purpose than to keep customers away from the stores of competitors and bring them into the stores of those seeking the legislation not only offends against economic law but is a sin against the spirit of democracy. The man who can't win when the rules are the same for both sides should play some other game.

Our quarrel with the anti-trust laws is that as interpreted they do not distribute their favors and handicaps impartially; that they permit the large corporation owner of many stores to manipulate prices in all of its stores at will, but do not permit the independent proprietors of the same number of stores to act in concert in doing exactly the same thing; that they make a crime of the *agreement* to do a thing which is not a crime when done by a single individual. In advocating the passage of the Capper-Kelly Bill by Congress we are not seeking to reverse the action of economic law nor to impose restrictions upon our competitors but only

the removal of the artificial handicap imposed by the Sherman Act, and to restore the freedom of contract which we claim to have had under the old Common Law.

Legislation Which Favors the Unfit Destroys the Fit.—Another limitation imposed by natural law is that legislation cannot successfully favor two opposite qualities of the same thing at the same time.

Whenever two qualities of a thing are in competition, whatever policy favors the inferior quality tends to the elimination of the superior. This is a universal law, prevailing alike in political economy, in biology and in sociology. When two kinds of money are in circulation, if the poor and cheap be made a legal tender it will drive the better kind out of circulation, and it will do this in spite of legal prohibitions and penalties. In agriculture whatever practice favors the multiplication of weeds reduces the quantity and quality of the useful crops. In any trade or professional group any policy which tends to favor the perpetuation of incompetents and weaklings tends in equal degree to discourage and eliminate the strong and vigorous, and in time to reduce the level of respectability of the whole group.

There may be those who would regard as ideal some kind of law which would, under all conditions, insure a profitable business to every pharmacist, even to the least capable and enterprising. To the thoughtful, however, such a law would indicate that pharmacy was to become the resort and refuge of the weak and incompetent from other social groups. It would be the last nail in the coffin of pharmaceutical respectability.

Before committing ourselves to any specified program of legislation or to any particular policy, therefore, it is important to have a clear understanding whether it is one which will favor the perpetuation and multiplication of weaklings and incompetents or one which will tend to weed them out. We cannot favor both at the same time.

It is not the true office of legislation, either by granting direct favors or imposing special burdens, to advance the interests of one class of citizens at the expense of other classes, but rather to hold the scales so evenly that no class may unjustly invade the rights of another.

Adjusting Pharmacy to the Needs of Civilization.—Is it not possible that we have in the past placed too much stress upon legislation as a means of advancing the prosperity of pharmacy and have devoted too little attention to the adjustment of pharmacists to the rapidly changing conditions of modern civilization?

No vocation can be expected to prosper beyond the measure of its ability to render service to the age in which it exists. Instead, therefore, of attempting to confine pharmacy to old channels and to restrict its development to the paths established by tradition, will it not be the part of wisdom to encourage pharmacists to seek new ways and methods of service?

All other lines of human activity have found it necessary to adjust themselves to new conditions: is it reasonable to expect that pharmacy shall be the single exception?

Passing of the Rule-of-Thumb in Business.—The wonderful era of invention and discovery which has given us the command of physical forces and materials possessed by our present civilization began when experimental methods and the use of instruments of precision were introduced into the investigations of the physical sciences. It was the result of the replacement of the methods of tradition

by methods established by deliberately planned research, and by the substitution of exact information obtained from controlled experiments for empirical rule-of-thumb.

We are now in the midst of a period in which the same methods of research and precision which have prevailed in the exact sciences are in process of being extended to the spheres of commerce and sociology. In psychology, in education, in political and domestic science, in business, and in all activities of our daily lives we are approaching a period when every conclusion will be subjected to experimental verification.

The modern theory of efficiency is that among all the possible methods of doing any particular thing there is one method which, measured by quality and quantity of results, is superior to all others, and that this one best method can be ascertained only by the process of definitely directed research.

Rule-of-thumb and hap-hazard methods are being driven out of business. The optimist who formerly rented the first store room found vacant is being replaced by the man who selects his store location only after careful investigation of the number and character of possible customers who pass each business day. The man who formerly counted his cash at the beginning and end of the year and considered the difference as loss or gain is being superseded by the man whose business is departmentalized, and whose balance sheet affords at all times a perfect picture of the profit or loss in any division of his business.

Whatever the problem may be, whether store location, selection of the stock of goods, sources of stock supply, or what not, business methods, more and more, are being controlled by information gained through planned experiments and less and less by tradition; more and more by the results of careful investigation and less and less by chance and guess-work.

As standardization and exact information have speeded up and intensified industrial methods, so they are being applied to intensify and accelerate commercial activities. Naturally those brought up in the old traditions resent being suddenly called upon to discard accustomed methods, and are hoping for some form of legislation that will enable them to continue along in the old ways. All such hopes are vain. After much lost motion and wasted energy they will discover that the course of evolution is determined by qualities planted in the nature of things before legislation enactments were invented.

The handwriting on the wall reads that if the pharmacist is to survive and prosper, he must improve his business methods by applying to them the same careful research and investigation that he formerly applied in perfecting pharmaceutical processes, and in improving the contents of the Pharmacopœia.

Quality of Men in Pharmacy of First Importance.—Of the many questions confronting pharmacy perhaps the most fundamental of all is not whether we are to have or not to have any particular kind of legislation but, What is to be the character of the future pharmacist?

No calling or profession can rise higher in public estimation than is justified by the average mental and moral qualities of its practitioners. If the men who are to constitute the rank and file of pharmacists are to be of first-class character and ability, they can be trusted to meet the problems of the future as they arise. If pharmacy is to become the refuge of second-class men, no magic of legislation can prevent it from being a second-class profession.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted By Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

THE PSYCHOLOGY OF EFFECTIVE DISPLAY.

(*Continued from February* JOURNAL.)

The extravagant settings and impossible situations in many of the present-day motion pictures frequently are the butts of criticism of competent judges. Yet these same motion pictures continue to attract millions of people every day.

The drawing power of the motion picture to the great mass of people lies in the entertainment it affords at a reasonable cost. To a person whose life is varied and active, the pictures have perhaps no particular appeal; but to the tired mother chained day after day to the same monotonous household tasks, to the shop worker endlessly performing one simple operation, to the office worker constantly mulling over interminable columns of figures which do and can mean nothing to him—to all these people, the pictures offer a relief from the humdrum sameness of their everyday work and life.

To be sure, the relief is intangible and not physical, but it is none the less real. Few people in the United States can enjoy personally the winter sports at Montreal. To the millions who cannot go there themselves, the motion pictures offer a partial and somewhat satisfying substitute. In imagination, at least, they are permitted to witness the joys of Montreal winter sports.

Imagination is defined as the picture-forming power of the mind, the ability to create ideas or images independent of the external world. Expressed in another way, imagination is the power to see mentally that which is not present physically at that moment. Motion pictures, in the example just mentioned, so stimulate the imaginations and memories of people that for the time being at least their thoughts and ideas are lifted above the deadly monotony of their everyday lives.

In the same way, the appealingly-told love story of a beautiful and wealthy heiress and a handsome, accomplished hero transports in imagination the audience to the happy, interesting realm in which the people in the picture story are shown to live.

Imagination is the power to call to mind that which never before has been experienced. The Florida child, for instance, may never have seen any snow, but when he sees motion pictures of Montreal winter sports, his imagination per-

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mits him to feel, nevertheless, how much he would enjoy them, were he to have the opportunity to do so.

Memory is the power to call to mind that which has been experienced before. The young couple who spent their February honeymoon in Montreal enjoy these happy days again in memory, when motion pictures of winter sports there call back to them all these pleasant memories.

Thus the powers of imagination and memory are invoked in similar ways; the basis of difference between imagination and memory simply is that imagination recalls the unreal and memory the real.

Now consider the practical application to effective displays of appeals to imagination and memory. The two things a display has to do in order to become effective are to attract attention and to hold attention. There are mechanical ways to hold attention (these were discussed in the preceding article in this series) and there are ways to hold attention which are inherent in the characteristics of what is being displayed.

One way in which imagination or memory operates to hold attention once attracted to a display is as follows: The floor of the window is covered with green grass. In the background is a khaki tent, appropriately furnished. The center of interest is a man frying bacon over a most realistic-looking camp fire, while to one side the feminine member of the party is busy at a camp table completing other preparations for breakfast.

To the person who has never camped, isn't that display an incentive to transport him in his mind's eye from the dull, hot sameness of his daily work to the glorious, cool freedom of the green woods? Many such people are bound to be impressed. They want to camp. In order to camp they must have equipment such as is shown in the display. What is more natural than that they should go to the store where it is displayed?

To the person who has camped, happy memories operate to call back to mind the joys of camping which are suggested by this display. Again, in order to camp, it may be necessary to secure additional equipment. Why not buy it at the store which displays it so temptingly and convincingly?

Appeals to the instincts and to the emotions can be used effectively in holding attention to displays. The reason that appeals to the instincts and emotions can be so successful is because everybody has instincts and emotions in one degree or another and therefore tends to respond to them where appeals are so directed. That is to say, the natural thing for a person to do is to respond to an instinctive or emotional appeal. Conscious control has to be exercised to keep from doing so.

The success of the well-known appeal, "four out of five have it," is laid to its shrewd excitement of the self-preservation instinct and the accompanying emotion of fear.

Displays of bathroom supplies hold attention with their appeals to the cleanliness instinct.

The foundation of the whole toilet goods business is of course upon the elemental human desire for beauty and attractiveness.

Customs, traditions and habits also may be made use of to hold attention to displays. They operate similarly to the instincts and emotions. The difference is that instincts and emotions are universal—everybody has them—while customs,

traditions and habits apply only to particular groups or classes of people. Nationalities are frequent dividing lines for customs, traditions and habits.

Displays expressing the spirit of the various holidays are probably the most frequent way in which appeals to customs, traditions and habits are made. A large group of people are interested in St. Patrick's day. They are therefore attracted to and interested in displays which express the spirit of St. Patrick's day, and the hope is that this interest will carry over to the merchandise which is shown in this display because its purchase will make the celebration of the holiday more enjoyable.

There is a danger in carrying to extremes this tie-up of various kinds of merchandise with the celebration of various holidays. "Give Mother a carpet beater for Christmas," or "Give Dad a snow shovel" makes not only that display ridiculous, but tends to discount and weaken the effectiveness of all holiday displays.

Mother's day, June weddings, graduations are all customs to which appropriate merchandise displays may be joined.

There is an old saying that appeals to the heart are quicker and surer than appeals to the head. In the light of the discoveries of modern science, this statement is entirely correct if appeals to the heart are considered to be appeals to instincts and emotions; to customs, traditions and habits; and to imagination and to memory. Appeals to the head may be defined as logical reasoning.

The reason that in window and store displays these so-called appeals to the heart far outweigh in importance and effectiveness appeals to the head is that window and store displays get at best in most cases but hurried and casual attention. Logical reasoning involves deliberation, weighing of arguments and choice. Window and store displays, by the very nature of the quick and casual attention they receive and hold, are but rarely likely to receive any such analysis and logical unfoldment of conclusions. A display, if it is to succeed at all, must appeal quickly and directly, and these quick, direct appeals are, as mentioned, appeals to instincts and emotions; customs, traditions and habits; and imagination and memory.

THE COMMON-LAW OBLIGATIONS OF THE PHARMACIST.*

BY WILLIAM J. HUSA.**

The work of the pharmacist is so regulated by law that to the casual observer it may seem that every aspect of the drug business is covered by some national, state or local law or regulation. But in addition to the statutes and regulations, which have their origin in the action of legislative bodies, there are the less explicit, though no less binding, obligations of the pharmacist at common law. These obligations are enforceable by civil suits for damages. In case of injury caused by some alleged neglect of duty on the part of the pharmacist or his agent, any situation which is not covered by a statute must be decided according to the rules of common law, which are to be found in the decisions of the highest courts in similar cases previously tried.

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* Presented at the 1927 meeting of the Florida State Pharmaceutical Association, Miami, Fla.

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One question which frequently arises is in regard to the degree of skill and diligence required of pharmacists. It is well established that the legal measure of the duty of a druggist toward his patron is properly expressed by the phrase "ordinary care" when considered with reference to that special business. (19 *Corpus Juris* 778.) This point was elucidated by Judge Cooley in the case of Brown *vs.* Marshall (41 *Am. Rep.* 728) in the following words:

> "People trust not merely their health, but their lives, to the knowledge, care and prudence of druggists, and in many cases a slight want of care is liable to prove fatal to some one. It is, therefore, proper and reasonable that the care required shall be proportional to the danger involved."

In the case of Tremblay *vs.* Kimball (77 *Atlantic Rep.* 405) the Supreme Judicial Court of Maine ruled that the pharmacist "need not possess the highest degree of knowledge and skill known in his profession; it being sufficient that he have that reasonable degree of learning and skill ordinarily possessed by other druggists in good standing as to qualifications in similar communities." This is a well-established point of law applicable to all trades and professions. Thus if a physician is sued for malpractice he would ordinarily have a good chance to prove that he had exercised the ordinary care and skill demanded of physicians. However, my study of numerous cases shows that the pharmacist who has made an error in filling a prescription does not have an equally good chance to evade the consequences by claiming that he exercised ordinary care as known to pharmacists. The reason for the difference lies in the fact that in making his diagnosis and prescribing treatment, the physician is working on a patient who is more or less of an unknown quantity, and no one can say with certainty just what his reaction will be to any certain treatment. The pharmacist who sets out to fill a prescription, however, has a definite written document, signed by the physician, and if he is in doubt as to the correct reading he is supposed to make inquiries of the physician, and the courts are inclined to hold the pharmacist fully responsible for any error in reading the ingredients or quantities.

This point is illustrated by a Connecticut case, Tombari *vs.* Conners (82 *Atlantic Rep.* 640). A physician wrote a prescription for powders to be taken three times a day, each powder to contain five grains of calumba, with other ingredients. The drug clerk used calomel instead of calumba in making up the powders. The Court of Common Pleas held that the clerk, by the exercise of due care, should have read the prescription as calling for calumba, or at least that there was such doubt as to the correct reading as should have led him to inquire of the doctor.

It is a well-known fact that in cases of gross negligence, punitive damages may be awarded in addition to the actual damages. Thus during the influenza epidemic a few years ago, a pharmacist in Kentucky used formaldehyde instead of paraldehyde in filling a certain prescription. When he was sued for damages caused by this error, the pharmacist sought to introduce evidence, by way of mitigation of punitive damages, that heavy demands were made on him owing to the severe epidemic, and that he was unable to secure additional help, and that his clerks were worn out and nearly exhausted. The trial judge would not permit this, and partly as a result, the plaintiff recovered a judgment of $3000, part of which was for punitive damages. However, the pharmacist appealed to a higher court, which

ruled that the trial judge was in error in refusing to permit this defense; the judgment was reversed and the case remanded for another trial. The higher court ruled that such a defense could be offered in mitigation of punitive damages, though it would not excuse the mistake, so as to relieve the defendant from liability for compensation.

Ordinarily, a person who sues a pharmacist for damages has the burden of proving that the pharmacist was negligent. An example of this is found in a case (77 *Atlantic Rep.* 406) in which a druggist furnished corrosive sublimate tablets instead of the chlorodyne tablets called for in the prescription. The burden of proof was on the plaintiff to show that the druggist failed to use the degree of care required by law, and this, in the case cited, was not a difficult matter. "But where a mistake consisting of the furnishing of a harmful for a harmless drug is shown, defendant has the burden of explaining the mistake and showing that under the circumstances it was consistent with the exercise of due care on his part." (19 *Corpus Juris* 784.) Thus in a Virginia case, a bottle sold and labeled as "witch hazel" was found to contain 10 per cent of silver nitrate. The defendants failed to rebut the presumption of negligence and thus lost the case.

The plaintiff, as a rule, also has the burden of proving that the defendant's negligence was the proximate cause of the alleged loss or injury.

Furthermore, it is well established (19 *Corpus Juris* 783) that a person claiming to be injured by the negligence of a druggist cannot recover damages if he himself was negligent in using the medicine. This is the well-known principle of contributory negligence. The druggist and customer, however, are not held to the same degree of care. The customer's duty is to exercise ordinary care for his own safety, while the pharmacist should employ the highest degree of care known to practical men for the safety of the public dealing with him.

In one instance a druggist, by mistake, sold common salt to a dairyman instead of Epsom salts. The common salt was given to a cow, which died as a result. In the damage suit which followed, it was brought out that the dairyman was familiar with both common salt and Epsom salts, and was able to distinguish between the two. It was therefore held that the dairyman was guilty of contributory negligence, and he could not recover against the druggist. (185 *Ala.* 653, 64 *S* 350.) In another case, in which the plaintiff had carried off the wrong package from the druggist's counter by mistake, it was held that this was contributory negligence. (78 *Conn.* 719, 62A, 661.)

An interesting example of contributory negligence is the case of Cullinan *vs.* Tetrault (122A, 770), which was passed on by the Supreme Judicial Court of Maine in 1923. The defendant, Tetrault, a druggist in Augusta, had occasion to be absent from his store on July 20, 1921, from about 6:05 in the evening for about an hour and a half. During that period the store was open and left in charge of a boy, who for about three years had worked at times for the defendant, sweeping the store, doing errands, selling cigars, soda and ice cream, on an average for about two hours a week. This boy was manifestly incompetent to be left in charge of the store. The court held this to be plainly negligent, notwithstanding that the defendant had instructed the boy not to sell medicines and drugs.

Cullinan and a man named Freeman met at a regimental reunion in Augusta and after leaving the muster field went to the drug store. Cullinan remained on

the sidewalk while Freeman entered the store. The subsequent testimony of Freeman to the county attorney was that he had asked the boy if he had any checkerberry. The boy answered that he was not sure, but he pointed to a bottle and reached for it and handed it to Freeman and asked him to smell of it to see if that was what he wanted. Freeman smelled the bottle, passed it back to him, and said it was what he wanted. Four ounces were purchased. The bottle from which it was poured was labeled methyl salicylate, which of course has the checkerberry or wintergreen odor. Freeman's testimony established that they purchased it for use as a beverage, "for the alcohol in it." The young men drank some of the methyl salicylate after mixing it with ginger ale; both became ill and Cullinan died the next morning.

On being sued for damages, the defendant pleaded contributory negligence. In upholding this contention, the Supreme Court made the following statement: "The incompetency of the clerk was evident to Freeman; the latter told the County Attorney, 'He (the boy) didn't appear to know much concerning the checkerberry or anything regarding the things in the store.' To purchase anything in a drug store from a boy who did not know what he was selling, had no realization of the dangerous qualities of the article, and appealed to the purchaser to know if it was what he wanted, and to accept the article offered solely upon the evidence of the sense of smell, disregarding the label on the bottle, is the height of negligence. If Freeman in purchasing the poison relied upon the knowledge of the boy, as he now says, he was negligent, because the boy's ignorance was apparent to him. If he relied upon his own judgment, he was negligent, because the bottle was plainly marked 'Methyl Salicylate' and he should not have relied solely upon the odor of the contents. His negligence is too evident to require further discussion." It should perhaps be mentioned that there was a conflict in the testimony in regard to whether Freeman had asked for "checkerberry" or "essence of checkerberry," but this point did not have any bearing in this particular case, because Freeman's subsequent actions were negligent. The Court further held that the deceased and Freeman were engaged in a joint enterprise and that the conduct of Freeman in the store was imputable to the deceased. Because of the contributory negligence of the plaintiff, the case was thus decided in favor of the defendant, although the druggist had plainly been negligent in the conduct of his store.

The fact that damage suits against pharmacists occur rather infrequently is a tribute to the skill and honesty of purpose of our profession taken as a whole. A very little delving into the law books, however, is sufficient to convince one that a pharmacist should exercise due care not merely most of the time but at all times. One mistake made out of 10,000 prescriptions filled makes an apparently high average of accuracy when compared with the batting or fielding average of a baseball player, but for that one mistake the pharmacist is apt to pay dearly in damages and loss of business. A pharmacist who has a high reputation for integrity and reliability has a jewel of great price, worth more than all the clever merchandising schemes ever concocted.

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THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

A. C. Taylor, President, Washington, D. C. J. W. Gayle, Treasurer, Frankfort, Ky. Lucius L. Walton, Chairman of Executive Committee, Williamsport, Pa. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming

ALASKA ELECTED TO MEMBERSHIP.

The Alaska Territorial Board of Pharmacy has been elected to membership in the National Association of Boards of Pharmacy by vote of the Executive Committee. Alaska is the forty-eighth board to join the ranks of the Association.

The admission of Alaska opens a new field in the annals of the N. A. B. P. Heretofore, only states within the boundaries of the United States have become members. This paves the way for other territorial and insular possessions to become members and expands the service and work of the N. A. B. P. to other portions of the globe.

Alaska has for some years past been granting registration to pharmacists from The States without examination. As a result of her affiliation, her own pharmacists are now made eligible for reciprocal registration in The States under the usual rules and regulations governing reciprocity.

A hearty welcome is extended to our new member by all boards of pharmacy holding membership in the N. A. B. P.

CONVENTION ANNOUNCEMENT—SILVER ANNIVERSARY.

The twenty-fifth annual convention of the National Association of Boards of Pharmacy—Silver Anniversary—will be held at Portland, Maine, Monday and Tuesday, August 20th–21st, with the Eastland Hotel as headquarters.

Edgar F. Carswell, Secretary of the Maine Board of Pharmacy, is Local Secretary for the AMERICAN PHARMACEUTICAL ASSOCIATION and is in charge of all the convention arrangements.

The convention was originally announced for Poland Spring, Maine, but as it was impossible to make satisfactory hotel arrangements for the month of August,

and it was thought unwise to postpone the convention until September, Portland was chosen instead.

All boards of pharmacy should begin making plans now for attendance. While the distance may be great to travel for the Western and Middle Western state delegates, it affords an unusual opportunity to visit scenic Maine during the height of its vacation season. The Silver Anniversary of the N. A. B. P. is an occasion in which all state boards will want to participate.

GIFT TO N. A. B. P. LIBRARY.

Dr. Morris Miner, for many years Professor of Pharmacy at the Northwestern University School of Pharmacy, and after its discontinuance in 1917, with the Illinois University School of Pharmacy, recently presented Secretary H. C. Christensen with some fifty odd volumes of text and reference books in pharmacy and allied sciences, many of them rare and therefore valuable.

This presentation was made as a memento of the many years of friendship which dates back to the days when the Secretary was a student in the classes of Dr. Miner at Northwestern University. The gift was accepted upon receiving assurance from the Doctor that it was satisfactory to him to have the books made a part of the historical and reference library pertaining to pharmacy which Secretary Christensen is collecting for the N. A. B. P.

The gift of Dr. Miner is deeply prized by Secretary Christensen and will, undoubtedly, be equally appreciated by the N. A. B. P. as a most valuable addition to its growing collection of books.

EXECUTIVE COMMITTEE MEETING.

The annual meeting of the Executive Committee of the National Association of Boards of Pharmacy will be held at the office of the Association in Chicago, 130 North Wells Street, on April 23 and 24, 1928.

GENERAL NEWS ITEMS.

President C. W. Johnson of the AMERICAN PHARMACEUTICAL ASSOCIATION recently appointed A. L. I. Winne of the Virginia Board and H. C. Christensen, N. A. B. P. Secretary, to the Committee on New Textbooks. The object of the committee is to publish a series of correlated texts and reference books, which shall cover the requirements of both the college course and of the practicing pharmacist.

A conference was held on February 8th at the N. A. B. P. office in Chicago, between John A. J. Funk, of Galveston, Indiana, Chairman of District No. 3, Dean William B. Day, Chairman for the college association in the same District and Secretary H. C. Christensen. Detailed plans were made for the meeting of the District on April 25th and 26th at the Hotel Bismarck, Chicago, and a program drawn up for immediate mailing.

One of the best state pharmaceutical association bulletins that has ever come to the attention of the central office is that of the Utah Pharmaceutical Association by John Culley, Secretary, dated Feb. 15, 1928. It completely covers the narcotic regulations in a simple, direct manner,

readily understood by anyone; gives a summary of the Caustic Poisons Act; calls attention to an article on "Advertising Hold-Ups" in the *Pacific Drug Review;* quotes "Alcohol for Compounding Prescriptions," as published in the *Chicago Retail Druggists Assocation Journal;* and gives information regarding "Searches and Seizures" by the federal government.

The final paragraph of the bulletin, entitled "One Advantage of a College Education," contains food for thought: "A successful business man was asked what was the most important thing he had learned in college. He very promptly replied that he could afford to discard all that he had learned there except 'the ability to distinguish between an opinion and a fact.' This ability he attributed to his scientific training. 'A collegiate training is possibly one of the best and quickest methods for training the mind to segregate the essentials of a problem, to correlate such essentials and then find a solution.'"

Secretary M. N. Ford of the Ohio Board, Ex-President of the N. A. B. P. and now a member of its Executive Committee, has just recovered from a six weeks' siege of illness. Friends will be glad to learn that he has returned to his post of duty.

F. H. King of Delphos, Ohio, was rceently appointed by Governor Vic Donahey to serve his seventh consecutive five-year term on the Ohio Board of Pharmacy. The appointment expires on March 31, 1933.

Of the six terms which he has already served, three of his appointments were made by Republican governors and three by Democrats. This shows that, after all, politics do not always govern the appointment of board members as some would suppose, especially in the case of a good man.

On January 30th of this year, Mr. King had been in business in Delphos for forty-five years. In the thirty years in which he has been a member of the Ohio Board, Mr. King has not missed a single meeting of that body. He is the oldest member of the board in point of service in its history, and his reappointment makes him the oldest member, in point of service, in any department of the Ohio State government. The N. A. B. P. is interested in hearing whether any other state board can equal or exceed this record.

STATE BOARD ITEMS.

Arizona.—Secretary Hulett reports that out of the sixteen applications already received for the April 11th–12th meeting, twelve are for reciprocal registration. He remarks, "In the near future, the state boards will only examine their local men who are coming up for the first time."

"The drug business is very good, there are few violations, and new stores are constantly opening," he adds. "The November class of the board was the largest in its history."

Kansas.—An examination meeting was held on Feb. 1st and 2nd at Wichita, Kansas. Six of the fourteen applicants writing the full registered examination passed; nine of the seventeen taking the assistant examination also passed.

Kentucky.—The annual report of the board for the year ending October 11, 1927, has been received. Of the 112 candidates examined during the year for registered pharmacist license, 30 passed. For the assistant license, 26 were examined and 13 passed. The total number of pharmacists registered in the state is 1707; assistants 170.

Seventeen pharmacists entered the state by reciprocity and 22 obtained reciprocal registration in other states.

The report of the attorney and inspector, Edward Bloomfield, is included; also a list of the names and addresses of all pharmacists and assistant pharmacists licensed to practice in the state.

Minnesota.—As a result of the January 19th meeting, the names of ten registered pharmacists and eighteen assistants have been added to the roll.

At the annual meeting, Hugo O. Peterson of Minneapolis was elected President of the board, and John W. Dargavel was reëlected Secretary.

George T. Kermott of Duluth was appointed recently as a member of the board to succeed Edwin A. Brown of Winona, whose term expired on January 1st.

Nebraska.—Fred J. Creutz of Wausa has recently been appointed a member of the Board of Examiners in Pharmacy to succeed Claude McVickers of Gothenburg.

Nevada.—The personnel of the board, including recent appointments, now stands as follows: W. R. Englert of Elko; H. H. Turrittin of Reno; R. W. Fleming of Tonopah; Earl B. Gratto of Coliente; F. M. Clark of Ely, Secretary.

North Dakota.—The Board of Pharmacy has employed an inspector to call on all the stores in the state and report violations, secure evidence, etc.

Ohio.—Examinations were conducted in Columbus on January 10th–11th. Thirty-seven out of the sixty-five candidates for the registered pharmacist certificate were successful, and five out of ten candidates for assistant license passed. The highest grade obtained in the pharmacist examination was 90.5; the highest in the assistant examination 84.3.

Reciprocal certificates were granted to Burt C. Beach of Missouri; Melville Schwartz of Illinois; Clair Studt of Michigan.

The next examination will be held in Columbus on April 3rd.

Oklahoma.—An examination was held in the Capitol Building, Oklahoma City, on Feb. 6th and 7th. Out of a class of twenty-eight candidates, twenty were successful.

Oregon.—At a meeting held on Tuesday, Feb. 14th, it was voted that the board rearrange its subjects of examination as follows, adding an oral quiz: (1) pharmacy, (2) materia medica and toxicology, (3) chemistry, (4) identification of drugs and practical work, (5) pharmaceutical law and pharmaceutical arithmetic, (6) oral.

Pennsylvania.—At the recent examinations held in Pittsburgh and Philadelphia, by the Pennsylvania Board of Pharmacy, there were 141 candidates for pharmacist reigstration and 171 for assistant pharmacist registration.

The Pittsburgh examinations were in charge of Charles C. Campbell and L. L. Walton. The Philadelphia examinations were in charge of Walter Rothwell, Henry W. Merritt and Charles F. Kramer.

A reception and dance was given in honor of the Pennsylvania Board of Pharmacy by the Western Pennsylvania Retail Druggists Association at the Fort Pitt Hotel, Pittsburgh, on January 25th. Over five hundred guests attended. There was much enthusiasm over the action of the Federal Court in sustaining the constitutionality of the Ownership Law and L. L. Walton gave an address on the meaning of the law and its effect on the future of the profession.

Governor Fisher has appointed John M. Woodside of Philadelphia as a member of the board of pharmacy, succeeding Walter Rothwell of Hatboro, resigned. Mr. Woodside's appointment was urged by a committee of officers of the Pennsylvania State Pharmaceutical Association as well as the deans of several schools of pharmacy in the state.

Virginia.—A bill to do away with the registered assistant pharmacist has been introduced and was reported favorably by the house committee on February 13th.

MEETING OF BOARDS AND COLLEGES OF DISTRICT THREE.

Following the joint meeting of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy held in Philadelphia in February 1926, a series of district meetings of the Boards of Pharmacy and Schools of Pharmacy was organized. The districts adopted were those already in use by the National Association of Boards of Pharmacy and District No. 3 includes the states of Illinois, Ohio, Indiana, Wisconsin, Michigan and Kentucky. The Boards and Schools of District No. 3 held their first meeting in Indianapolis, May 6 and 7, 1927. Every Board of Pharmacy was represented, some by their full membership, and with one or two exceptions every School of Pharmacy in the district was represented by one or more members of its faculty. The second meeting of the Boards and Schools of District No. 3 will be held in Chicago, April 25 and 26, 1928, with headquarters at the new Bismarck Hotel. John A. J. Funk of Indianapolis, Chairman for the Boards of Pharmacy and W. B. Day, Chairman for the Schools of Pharmacy met recently with Secretary H. C. Christensen and prepared a tentative program for this joint meeting, a copy of which is enclosed. So successful was the 1927 meeting that a full attendance of the six state Boards of Pharmacy and the fourteen Schools of Pharmacy of the district is expected. Secretary Christensen has offered the facilities of his office

to the delegates and will provide stenographic service for the meeting. A feature of the program will be a visit to the $350,000 building recently completed and occupied by the University of Illinois School of Pharmacy. The district is fortunate in having among its members not only the Secretary of the Association of Boards of Pharmacy but the President of the American Association of Colleges of Pharmacy, Dean Edward Spease of the Western Reserve School of Pharmacy, Cleveland, Ohio.

TENTATIVE PROGRAM.

1. Board Examination Results for Colleges.

Shall the schools be supplied with board examination grade sheets from which they may select their own graduates? No designation to be made of school from which candidates graduated.

2. Scope of the Board Examinations.

(*a*) Shall suitable questions in third-year subjects, such as bacteriology and drug-assaying, be included with the understanding that such questions shall be of a nature to test the candidate's ability to use this knowledge in his pharmaceutical practice?

(*b*) Cannot a knowledge of the fundamental sciences of chemistry, botany and physiology be safely assumed, at least to the extent of omitting elementary questions from examination in college prerequisite states?

(*c*) Would it not be well to include in the examination in pharmaceutical arithmetic such questions as will impress on the candidate the importance of an ability to estimate profits, overhead, turnover and similar phases of business?

(*d*) Should not a definite scheme for avoiding the over-lapping of the fields such as pharmacy and materia medica be formulated?

3. A Discussion and Study of State Board of Pharmacy Questions Submitted as Follows:

Chemistry	Illinois
Materia Medica	Ohio
Pharmacy	Indiana
Practical Pharmacy	Wisconsin
Pharmaceutical Mathematics	Michigan
Oral Quiz	Kentucky

These questions will be presented by a board of pharmacy member from the state designated and then discussed by both board and college delegates.

4. Relations of Boards and Colleges.

(*a*) Should members of college faculties serve on boards?

(*b*) Should any officer of a college of pharmacy serve as a board member?

5. Recognition of Schools of Pharmacy.

(*a*) Report on recognized and unrecognized schools in the district.

(*b*) On what basis may non-member (of the A. A. C. P.) schools be recognized locally?

TREATMENT FOR DANDRUFF AND FALLING HAIR.

The *Journal of the A. M. A.*, in a recent issue, replying to a correspondent states that the following is a favored prescription for dandruff and falling hair:

Mercuric chloride, 3 Gm.
Resorcinol monoacetate, 6 Gm.
Castor oil, 6 cc.
Spirit of formic acid, 20 cc.
Compound spirit of Myrcia to make 120 cc.

The correspondent is advised that this preparation should be rubbed into the scalp once a day, the fingers being covered with rubber cots to prevent irritation of the tips. The composition indicates the necessity of the physician to caution the user.

KRAMERIA OINTMENT.

E. Goldhammer (*Dermatologische Wochenschrift*, Vol. 84 (1927), p. 529, through *Chemist and Druggist*) gives the following formula for Krameria ointment, which he recommends as an application to hasten epitheliation: Thymol, 1 Gm.; extract of krameria, 10 Gm.; white wax, 18 Gm.; lard, 71 Gm.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

THE TEACHING OF PHARMACOGNOSY.

BY CHARLES C. PLITT.

Teachers of pharmacognosy will be interested in the following article by C. C. Plitt. I have no record of the discussion that followed the reading of this paper. Perhaps it would be illuminating.

Our Teachers' Conferences will justify themselves in so far as exchange of ideas about teaching are made. C. B. JORDAN, Editor.

In the teaching of Pharmacognosy, there probably cannot be a great many ways of attacking the problem, and, no doubt, the way I am about to describe, is the way of many other teachers. As a matter of fact, I can think of but two ways of handling the subject.

Lest there be some who may use the terms I am using with a different meaning, I will say that under Pharmacognosy, I mean the study, or art, of recognizing the drug in question, and is here restricted to those of plant and animal origin. We know, too, that these may be either in the whole state or in powdered condition. This paper deals only with drugs in their natural and entire condition. By Materia Medica, I mean the study of drugs to the fullest, Pharmacognosy being one of its many sub-divisions.

In teaching Materia Medica, there are several ways in which drugs may be studied; thus, they may be taken up alphabetically, as they are in the Pharmacopœia and the National Formulary. They may be taken up according to their therapeutic actions, when all the astringents are studied together, all the stimulants, the demulcents, etc. Again, they may be taken up according to their morphological structure, all the roots being studied together, all the flowers, all the leaves, etc. Or, they may be studied according to their chemical constituents, when all the starchy drugs are studied together, all those with volatile oils, all those with alkaloids, etc. And, finally, they may be studied, taking the drugs up in what is called their natural sequence, the various plants producing drugs being taken up by beginning with the lowest and simplest of the Thallophytes, then up through the various sub-groups of the Plant Kingdom to the highest of the Spermatophytes, the order being according to their natural affinities or relationship, the lowest evolved coming first and the highest evolved last. In the study of Materia Medica, this is probably the best and only right way, and many authors of textbooks follow it.

To return to my statement, that I can think of but two ways to teach Pharmacognosy: Either take up the drugs according to their natural sequence, which I described as probably the best and the right way to teach Materia Medica, or to take them up according to their morphologic structure. Although I am sure that the former is the right way to teach Materia Medica, I am equally as certain that the latter is the only right way to teach Pharmacognosy. I have tried it out during the past three years and am convinced of it.

My way of teaching Pharmacognosy, and it may be peculiarly my own, is to divide the two hundred and fifty or more drugs, described in the Pharmacopœia and the National Formulary, into several groups, and these into sub-groups. My aim is to get drugs closely resembling each other close together.

The first group of drugs that I take up is that of "Leaves." I start with leaves, because as a group their study is the easiest. They are easily drawn, and for the most part easily recognized, and students are not likely to become disgusted with the subject at the very beginning. I divide the group of leaves into three sub-groups: small leaves, medium-sized leaves and large leaves. My first lesson is on the small leaves, just six in number. I bring the six leaves into the class room, Buchu, Pilocarpus (I still hold on to Pilocarpus, although no longer official, because it is the source of Pilocarpine), Uva Ursi, Senna, Chimaphila and Damiana. I explain to the class how I am able to recognize each of them. I show them that we can separate them into two divisions, some with pellucid dots, and some without pellucid dots. There are two with pellucid dots, Buchu and Pilocarpus, and these two can be easily separated, one having a serrated margin, Buchu, and one with margin entire, Pilocarpus. There are four in the division without pellucid dots. These four can be separated into two sub-divisions, some with margin entire, and some with margin serrated. If margin is entire it is Uva Ursi if the leaf is thick, and Senna if it is thin. If Senna, it may be Alexandria Senna, or it may be India Senna, and they are told how to distinguish them. I should have stated also, under Buchu, that students are told, how to recognize the species of Barosma that are known as Long Buchu, and which are Short Buchu. To return to our discussion, if the margin is serrated, it is Chimaphila if the leaf is thick and Damiana if it is thin. Other peculiarities of these leaves are brought forth, especially those that distinguish closely related species that may be official. Students must look up the Latin name, English name, Synonyms, Botanic Source, Family, Part Official, Habitat, Properties, Preparations and Doses, answers to all of which must appear on the laboratory sheet, when it is handed in. In the laboratory, these drugs are distributed as numbers, and part of the lesson is in determining the drug. Students draw the leaves, and besides answering the questions given above, add their own observations.

The next lesson is on the medium-sized leaves. In this sub-group, I include Eriodictyon, Althææ Folia, Malvæ Folia, Hamamelis, Matico and Boldus. These I divide into two divisions, those covered with resin, Eriodictyon, and those not so covered, the remaining five, which are divided into two sub-divisions, those with petiole long and those with petiole short or none. Under petiole long, it is Malvæ Folia if petiole is from four to eight inches long, and Althææ Folia when petiole is only about one-fifth length of blade. Under petiole short or none, it is Boldus if leaf is symmetrical, and either Hamamelis or Matico if unsymmetrical, Hamamelis if margin is undulate, and Matico if margin is merely rough and almost entire.

The lesson on large leaves includes Eucalyptus, Farfara, Verbasci Folia, Castanea, Digitalis, Belladonnæ Folia, Stramonium and Hyoscyamus. I separate these into two divisions, those with pellucid dots, Eucalyptus, and those without pellucid dots, the remaining seven. These, in turn, are divided into two subdivisions, those more or less woolly, Farfara and Verbasci Folia, and those not

woolly, the remaining five. Farfara is distinguished from Verbasci Folia by being woolly on lower side only, whereas Verbasci Folia is woolly on both sides. The leaves that are not woolly are distinguished as follows: If margin is serrated, it is Castanea, if crenate it is Digitalis, if entire it is Belladonnæ Folia, and if incised it is either Stramonium or Hyoscyamus, the latter if glandular hairy and the former if almost smooth.

Since fruits may be present in the case of Belladonnæ Folia and Hyoscyamus, this is mentioned: They are described and give additional aid in recognizing these two drugs. Since Belladonnæ Folia, Digitalis, Stramonium and Hyoscyamus come crumbled and in almost unrecognizable state for beginners, I have hot water on hand when this lesson is given, and students soak the leaves. When this is done, their margins may be studied with some satisfaction.

The leaves having now been studied, the three little keys are put together and we have our scheme or key for recognizing the official leaves. A review is now given and interesting facts like these are brought forth: Which of the official leaves have pellucid dots? Which are woolly? Which have an entire margin? Which Families are represented? Which Family is best represented? Which next best? Name the official leaves belonging to each of these families. Which of the official leaves can be recognized by their odor? etc., etc.

KEY FOR LEAVES.

- Leaves
  - Small
    - With pellucid dots
      - Margin serrated ..... Buchu
      - Margin entire ..... Pilocarpus
    - Without pellucid dots
      - Margin entire
        - Thick ..... Uva Ursi
        - Thin ..... Senna
      - Margin serrated
        - Thick ..... Chimaphila
        - Thin ..... Damiana
  - Medium
    - Resinous ..... Eriodictyon
    - Not resinous
      - Petiole long
        - Petiole, 1/3 length of blade ..... Althææ Folia
        - Petiole, 4–8 inches long ..... Malvæ Folia
      - Petiole short or none
        - Unsymmetrical
          - Margin undulate ..... Hamamelis
          - Margin almost entire ..... Matico
        - Symmetrical ..... Boldus
  - Large
    - With pellucid dots ..... Eucalyptus
    - Without pellucid dots
      - Woolly
        - Lower side only ..... Farfara
        - Both sides ..... Verbasci Folia
      - Not woolly
        - Margin serrated ..... Castanea
        - Margin crenate ..... Digitalis
        - Margin entire ..... Belladonnæ Folia
        - Margin incised
          - Almost smooth ..... Stramonium
          - Glandular hairy ..... Hyoscyamus

Having disposed of the official leaves, I next take up the seeds, then the seed-like fruits and fruits. I have no reason for this, except that I believe that the drugs belonging in these groups are easier to study than the groups which I take up later. Here, again, the same scheme is followed as with the leaves, things that resemble each other closely are brought together, and the differences that distinguish them from one another are brought out. Especially difficult are such groups as the one composed of fruits of the Umbelliferæ, and the one composed of Piper, Cubeba, Pimenta, Cocculus and Rhamnus Cathartica. However, differences are noted, keys are prepared and the matter of recognizing each particular drug becomes simple and easy. The greatest difficulty that I have to contend with is not in recognizing the drug, but the difficulty of remembering the name.

After the fruits, I have a group that I have called "Odds and Ends." In this group I put such dissimilar things as Ergota and Caryophyllus, Sabal and Galla, Scilla and Tragacantha, Camphora, Cetaceum and Paraffinum, and is followed by the Gums, the Resins, the Balsams and then the Woods. After which, I take up the "Herbs," those drugs whose official part includes not only leaves but frequently flowering tops, and sometimes even the whole plant, including the roots. After the "Herbs" come the official flowers, including parts of flowers, for example, Crocus and Zea. Then the roots, including rhizomes, corms and bulbs, and last of all, the barks. The scheme followed is always the same, and those drugs most nearly alike are studied together.

My final examination always consists of two parts. In the first part a student is given a package in which he finds five smaller packages. In one of these smaller packages he will find small leaves, which may be those of but one drug; they may, however, be a mixture of two drugs, or even of three drugs. In another of these smaller packages are large leaves, those generally required to be soaked in order to study them, and again they may be those of one, two or three drugs. The medium-sized leaves are also put into this package. In a third package are found barks, in the fourth roots, including rhizomes, etc., as stated above, and in the fifth any of the remaining drugs, odds and ends. Since each small package contains either one, two or three drugs, the number of drugs can vary from as few as five to as many as fifteen. I arrange that each large package contains just ten, although this number is not known to the student. All he knows is that he must have at least five to determine that he may have as many as fifteen. In taking this part of the examination, the student is permitted to make use of his notes, the Pharmacopœia, the National Formulary, in fact anything, excepting aid from some other student. The second part of the examination consists in recognizing ten different drugs, selected so as to make a fairly representative group, a few easy, a few fairly easy and a few difficult, this time without the use of notes. The student, after recognizing the drug, writes down its Latin name, English Name, Synonym, Botanic Source and Family. If a student misnames a drug, no credit is given him for any part of the question, unless there is good reason in believing that there was some justification in making the error. The results of the two examinations are averaged together and give the mark for the year.

MORE SCHOOLS OF PHARMACY ADOPT THE FOUR-YEAR COURSE.

Those who are interested in the educational development of pharmacy in the United States will be pleased to know that four more colleges of pharmacy will be rapidly added to the list of those colleges that have eliminated the shorter courses and offer only the four-year course as a minimum. I have just been informed that the deans of the four Pacific Northwest Colleges of Pharmacy; namely, The Oregon State Agricultural College School of Pharmacy, Corvallis, Oregon, North Pacific College of Oregon School of Pharmacy, Portland, Oregon, The Washington State College School of Pharmacy, Pullman, Washington and the University of Washington College of Pharmacy, Seattle, Washington, at a conference of the deans and faculties of the above-named schools held at Portland, Oregon, January 28, 1928, decided to discontinue the three-year course for students entering the above-named colleges for the school year of 1930–31. Beginning with the school year of 1930–31, the four-year course will be the minimum course of instruction offered.

The same mail brings a statement from the Chancellor of the University of Porto Rico as follows:

"I am delighted to inform you that the faculty of the College of Pharmacy after a careful study of the problems of the College and of the pharmaceutical profession in the island, has voted that the three-year course in pharmacy shall be discontinued as rapidly as the students now enrolled in that course complete their diploma requirements. Students enrolling in the College of Pharmacy for the first time in the Fall of this year and thereafter will enroll in a four-year course leading to the bachelor's degree in this field."

Beginning with 1930 these five colleges will be added to the present list of Ohio State University, University of Minnesota and the University of Nebraska as colleges that do not offer less than a four-year course. I believe that this indicates that pharmacy will rapidly reach the dignity of a profession and I hope that the action of the above-named colleges will be a spur to other colleges to take similar action.—C. B. JORDAN, *Editor*.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council."
—Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The January meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Emerson Hotel on Friday evening, January 27, 1928.

The speaker of the evening was Dr. Olaf S. Rask of the School of Hygiene and Public Health of the Johns Hopkins University. His address consisted of a report on an experimental study of the biological and dietary properties of aluminum compounds recently completed by E. V. McCollum, O. S. Rask and J. Ernestine Becker, in the nutrition laboratories of the School of Hygiene and Public Health. The summary and conclusions were as follows:

Rats were fed diets containing 600 p. p. m. of the element aluminum both in the form of the choloride and in form of the residue of sodium aluminum sulphate baking powder. The ash residues of all organs of rats so fed for eight months and the ash residues of baby rats born of them contained less aluminum than could be detected by a spectrographic technic capable of detecting 0.005% of aluminum in the ash. This is equivalent to 0.5 p. p. m. on the basis of the fresh tissue when an ash content of 1% is assumed. Therefore aluminum compounds are not absorbed out of the intestinal tract. Spectrographic examinations of the intestinal and stomach walls of rats which had been raised on aluminum containing diets showed that aluminum when present in the diet does not form any union with the walls of the alimentary tract. Aluminum compounds in the diet in concentrations as high as 600 p. p. m. of the element aluminum exert no noticeable action harmful to growth, reproduction or general well-being as judged by external appearance and autopsy.

Slides were used to indicate the methods of

spectroanalysis used in the study of the aluminum compounds.

The report of the *Treasurer*, also the reports of the standing committees were received.

In the report of the Committee on Education and Legislation, Chairman R. L. Swain gave a résumé of the important developments in pharmaceutical education and legislation during 1927, calling particular attention to the passage of the prerequisite law for the District of Columbia; the passage of the Federal Caustic Poison Act, the educational work done in the effort to have the present Congress pass the Honest Merchandising Bill, otherwise known as the Capper-Kelly Bill; and the possible passage of the Cosmetic Bill as introduced by Senator Copeland. He also cited the decisions of the Arizona and South Dakota courts in nullifying the restrictions of sales of patented and proprietary medicines to pharmacists, such restriction being considered unreasonable and not a proper exercise of the power of the state.

Chairman John C. Krantz, Jr., in reporting for the Committee on Science and Practice of Pharmacy mentioned the many interesting research studies now being conducted in different institutions, including the effort to solve problems of the National Formulary concerning distinguishing tests, development of assays, etc.; the purification of the active principle present in the liver; the isolation of the active principle of the pituitary gland; the study of the chemical nature of insulin, the tests being made with synthalin, which may be administered by mouth, to relieve the cardinal symptoms of diabetes; the preparation of the homologues of ephedrine and study of pressor and depressor actions; and the effect of light on the stability of different galenical preparations. The following officers were reëlected for 1928:

President, L. M. Kantner, 700 W. North Ave., Baltimore.

Vice-President, Frank L. Black, 2839 W. North Ave., Baltimore.

Secretary-Treasurer, B. Olive Cole, Greene & Lombard Sts., Baltimore.

Committee on Membership: Chairman, Charles C. Neal, L. S. Williams, Aquilla Jackson.

Committee on Professional Relations: Chairman, Charles L. Meyer, E. G. Eberle, John S. Donnet.

Committee on the Science and Practice of Pharmacy: Chairman, John C. Krantz, Jr., H. E. Wich, Wilmer H. Schulze.

Committee on Education and Legislation: Chairman, R. L. Swain, A. G. DuMez, E. F. Kelly.

B. Olive Cole, *Secretary-Treasurer.*

CHICAGO.

The 172nd meeting of the Chicago Branch of the American Pharmaceutical Association was held Tuesday evening, February 21st, at the University of Illinois School of Pharmacy building.

President Gathercoal introduced the speaker of the evening, Dr. L. J. Schwartz, of the U. S. Bureau of Chemistry, New York.

Dr. Schwartz told of his recent visit to West Africa, where he studied the production of cocoa. He gave a vivid description of the trip along the coast of Africa, through the section known as the Gold Coast, and his trips inland through the plantations and native villages. His talk was well illustrated with pictures taken during his trip. He described the life of the natives and their habits. The native food consists principally of bananas and cassava. The lack of sanitation throughout many districts accounted for the great number of cases of yellow fever, and bubonic plague.

The cacao tree grows to a height of 16–18 feet, and yields two crops a year. The tree presents an unusual appearance because of the fruit which grows on the trunk of the tree. The fruit is about 6 inches in length and half that in diameter. The seeds are removed, piled on banana leaves, covered with banana leaves and allowed to stand for 7 to 14 days. Fermentation takes place and the bean changes from a purplish color to a rich brown. This fermentation is necessary to good quality. The pulp and the bitter taste are destroyed. The aroma is improved and the drying is easier. The beans are usually spread on a canvas on the ground to dry or spread on bamboo mats. The drying is done slowly to prevent baking the shell. Poor or moldy cocoa is often due to incomplete drying because of frequent rains. The facilities for drying are very poor, a few places, however, having concrete platforms on which to dry the beans. The best grade known as F F A contains not over 5% of moldy or gray beans. Head portage is the usual mode of conveyance of the sacks of cacao beans. The natives often carry two sacks (equivalent to 300 lbs.) on their head. The women and children likewise carry enormous loads. Because of poor

harbor facilities the sacks of cacao beans are loaded into row boats and delivered to the steamers at anchor in the deeper waters. It is during the loading of the vessels that many of the sacks become wet and finally become moldy. Previously 30% of the cocoa from West Africa had been refused at New York because of mold. At present none of the cocoa has been refused; about 60 to 65% of the supply of the United States comes from West Africa. Some moldy cocoa has been used in the manufacture of cacao butter.

A general discussion followed, and Dr. Schwartz was given a rising vote of thanks for his most interesting address.

DETROIT.

The first of a series of Students' Nights was held at the February meeting of Detroit Branch A. PH. A on Thursday, the 16th. Twenty-two attended the dinner which preceeded the meeting. This number was swelled to about seventy-five before starting the program. The President called the meeting to order immediately after dinner with a few words of welcome to the students. The College of Pharmacy of the University of Michigan sent ten students accompanied by Dean Kraus, Professors Stocking and Powers. The Detroit College of Pharmacy and the City College also turned out in force.

The minutes of the previous meeting were read by the Secretary and approved.

Chairman R. T. Lakey of the program committee, reported that Dr. Ruth would be present at the March meeting of the Branch and show two complete educational films. One on Biologicals and the other on Cod-Liver Oil. A general discussion took place as to the possibility of making this a banner meeting, by inviting the medical students, members of Wayne County Medical Society and of other organizations interested in pharmacy, to attend this meeting.

It was moved by Mr. Seltzer that the arrangements be left to the program committee.

There being no further business, President Wheeler introduced the first student speaker, Donald Breisch, of the University of Michigan. He read a paper on "What Pharmacy Means to Me." He was followed by Milton Rose of the Detroit College of Pharmacy whose subject was "What Is a Pharmacist?" William Bertram of the same school followed with a paper "Why I Chose Pharmacy as a Profession," Richard Charles Bryce of the U. of M. followed with a paper entitled "Present-Day Educational Requirements for the Retail Pharmacist," Mr. Gingell of the D. C. P. was next on the program followed by I. Helper of the City College, he in turn, was followed by McHaney of the D. C. P. Mr. Levecque read a paper entitled "Are Returns Adequate for Time and Money Spent in Pharmacy." A paper by Mr. Hoag of D. C. P. was handed in to the committee by Mr. Crandall, he being unable to attend. Mr. Clawson of the D. C. P. presented a paper on "Ethical Pharmacy." He was followed by Albert Feldman of the same school. The last of the twelve papers was presented by John H. Webster, Jr. of the U. of M. on "New Relations between Druggists."

Chairman Lakey thanked the students for the wonderful support given him and the way they responded in making the program most interesting.

Mr. Seltzer said the students of to-day are far superior to those of years gone by. He complimented the students on the fine papers which he said embodied fine diction and arguments well presented.

F. F. Ingram, Jr. was pleased with students to remain students; that is, students in Pharmacy, after they get out into the world and away from school. He pointed out that the successful men in Pharmacy are always students in the profession.

Mr. Hall told the students of the opportunity the AMERICAN PHARMACEUTICAL ASSOCIATION offers them and invited them at some time to become members. He said the "fountain of knowledge" was open to everyone who is desirous to drink from the cup. He encouraged them to attend the meetings of the BRANCH and learn from the experiences and views of others. The A. PH. A., he said, gives the student a larger field contact and an opportunity to receive condensed pharmaceutical literature, through the JOURNAL.

Mr. Seltzer moved a vote of thanks to the deans of the colleges for their hearty support and the interest stimulated in the student-body. After a vote of thanks an announcement was made of an added fifteen dollars by Mr. Ingram, bringing the total prize money to $40.00. Mr. Diekman added that he was satisfied the prize had accomplished its purpose.

Immediately following the meeting, the Committee, consisting of Dean Kraus of the U. of M., Dean Stout of D. C. P. and Dean Lakey of the City College, met to decide on the best papers. They found this a rather difficult

task. Every paper presented seemed worthy of consideration. After much debating the winners were decided upon as follows:

Donald Breisch, University of Michigan.

Richard Charles Bryce, University of Michigan.

Milton Rose, Detroit College of Pharmacy.

Mr. Clawson, Detroit College of Pharmacy.

I. Helper, College of the City of Detroit.

The winners are to present papers at the April meeting for the prize or prizes as the committees in charge deem advisable.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held the evening of the 9th with Chairman Eddy presiding. The Committee on Nominations presented the following names who were unanimously elected for office during 1928:

President, Hugo H. Schaefer
Vice-President, Richard H. Timmerman
Secretary, Robert R. Gerstner
Treasurer, Turner F. Currens.
Committee Chairman: Progress of Pharmacy, Dr. George C. Diekman; Legislation and Education, Robert S. Lehman; Membership, Solomon B. Groisser; Fraternal Relations, Curt P. Wimmer; Audit, Jacob Diner.

The speaker of the evening was Murray Breese, editor of the *American Druggist,* who spoke on "The Dispensing Doctor and the Prescription Department." From figures he had obtained, he believed seventy-five per cent of physicians dispensed their own medicines. He did not think that druggists could very well object to dispensing by physicians, but that they should insist that the medicos were as well qualified as pharmacists to dispense. The proper step to take would be to lend every effort to amend the pharmacy acts so that physicians would have to be licensed to dispense. This would be in the interest of public welfare for, as the speaker pointed out, medical colleges devote but few hours in their curriculum to the subjects of pharmacy, dispensing incompatibilities, etc., as compared with pharmacy schools.

In the discussion following, Samuel S. Dworkin said that while the subject was not new, it was always interesting, as it is their bread and butter. He did not believe the evil could be eradicated, for it was the tendency of the times. In any case, how could the physician be prevented from dispensing the pharmaceutical products like milk of magnesia, etc? Then again there were physicians' supply houses who only cater to physicians and one must remember the physicians who are interested in companies making their own preparations.

The only suggestion he could offer to ameliorate the evil is coöperation between the medical and pharmacy colleges.

Solomon B. Groisser also felt it would require much legislation to remove the evil and believed that the doctor is unaware of the harm he is doing himself and his profession in not coöperating with druggists. He agreed with Mr. Dworkin that coöperation between the colleges and agreement in the matter of counter-prescribing and office-dispensing would help to solve the problem.

E. L. Newcomb agreed that legislation will not correct the condition and pointed out that in Minnesota, his former home, there is close coöperation between the two professions with most beneficial results.

Nathaniel Nicolai said one phase had been overlooked and inquired why the average pharmacist sits back and waits for the doctor to come to him. Why not take time off and call on the physician? Detail him regularly. Each pharmacist should take a section covering his neighborhood physicians and call regularly in the interest of U. S. P. and N. F. propaganda and specialties which he considers would interest the medical men. In this regard he cited the work of Seltzer in Detroit who had been very successful in obtaining the coöperation of physicians.

Robert R. Gerstner, considered some druggists were too subservient. Those who studied and kept well posted re their profession felt equal to anybody and enjoyed the respect of physicians. He was afraid that physicians had lost confidence in pharmacy but that this could be regained if druggists will quit turning their stores into goulash dispensaries. Further discussion was entered into by Chairman Eddy and others.

R. R. GERSTNER, *Secretary.*

NORTHWESTERN.

A meeting of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held jointly with the Scientific Section of the Minnesota State Pharmaceutical Association, on Wednesday morning, February 15th, in the ballroom of the Nicollet Hotel, Minneapolis, Minn.

Chairman Wulling of the Scientific Section and President C. V. Netz of the Northwestern Branch presided at the meeting.

The chairman of the various standing committees of the Scientific Section made their reports and the following papers were presented:

"The Professional Aspect of Pharmacy," by H. O. Tiegen.

"Casual Observations," by J. B. Christgau.

"Corks," by Miss Elizabeth Malerich.

"Accurate Percentage Solutions by the Weight to Volume Method," by Dr. C. H. Rogers.

Officers elected by the Northwestern Branch for the following year are:

President, Rugnar Almin, College of Pharmacy, U. of M.

Secretary-Treasurer, C. V. Netz.

C. V. NETZ, *Secretary*.

The second meeting of the Northwest Branch of the A. PH. A. for the year 1928, was held at the College of Pharmacy on Friday, February 24th. The program was as follows:

Calling the meeting to order and brief remarks by the newly elected Branch President Rugnar Almin.

"A Brief History of the A. PH. A. and Its Achievements during the Last Seventy-Five Years," by Dean Wulling.

"A Comparison of the Practice of Pharmacy To-day with the Practice of Earlier Years," by Charles V. Netz.

"The Handling of Biologicals by Pharmacists." A special lecture by W. B. Wardwell.

Discussion of the special lecture.

C. V. NETZ, *Secretary*.

PHILADELPHIA.

The February meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, February 14th, at the P. A. R. D. building, President Hendrickson presiding.

Upon a motion from the floor the reading of the January minutes was dispensed with.

Chairman of the membership committee, Leo Penn, reported two new applications for membership as follows: A. E. Boonin and B. Eskin, of Philadelphia. The secretary also reported one membership, J. G. Ricketts of Hawaii. These three were accepted pending formal acceptance by the parent organization.

The President appointed the following committees to report at the March meeting:

Committee on Nominations: *Chairman*, Ambrose Hunsberger, Wm. L. Cliffe, Charles H. LaWall.

Auditing Committee: *Chairman*, F. P. Stroup; J. W. E. Harrison.

The annual dinner to the Past-Presidents will precede the March meeting, at which time election of officers will take place for the coming year. The President called the attention of the membership to the fact that the week of March 18th to 24th has been set aside as "First Aid Week" and plans are being made for pharmacists to observe this week in a satisfactory manner.

The February meeting was in fact a joint meeting of the Local Branch with the Philadelphia Association of Retail Druggists. An invitation had also been sent out to important organizations and as a result the hall was packed. As the President called the meeting to order an opportunity was given for delegations of nearby organizations to announce their presence and this resulted in responses from one or more from Delaware, New York City, Milton, Pa., Harrisburg, Pa. and Fort Wayne, Ind.

The guest of the evening for this joint meeting was Congressman M. Clyde Kelly representative from the 33rd District of Pennsylvania. Mr. Kelly is one of the co-authors of the Capper-Kelly Fair Trade Bill which has been presented at the present session of Congress and is now in the hands of a Committee.

Mr. Kelly gave a most interesting and vivid story of the Fair Trade Bill from its first inception years ago up to the present time. He first called attention to the fact that there is considerable misunderstanding about the question of resale price legislation. He pointed out that the Bill only protects those who desire protection and is not in any way compulsory upon a manufacturer who does not desire such protection as regards the resale price of his product.

He cited several instances where large corporations by making consignments were allowed by the Supreme Court to maintain set price but, on the other hand, the small merchant, who is unable to handle his wares on a consignment basis but must send out his goods in a less expensive manner, is unable to take advantage of this privilege of price maintenance.

The court ruling in regard to the small

dealer was to the effect that he was a restrainer of trade through his attempt to standardize his prices, but Mr. Kelly's interpretation of a restrainer of trade referred to the price cutter who takes the standard article and cuts it in two in order to attract the unsuspecting public so that they may "bite" on articles of unknown value. A manuacturer goes to a great expense to market a product which is of good quality and the public wants his product because of its quality. Then, however, the price-cutter steps in, and because of the popularity of this item he uses it as a bait with which to draw in the public so as to sell them other goods upon which he more than makes up any loss which results from the first sale. Because they cannot meet this kind of competition other retailers are forced to give up the sale of this item which in turn reflects back to the manufacturer of the product whose sales are consequently greatly diminished.

Mr. Kelly cited several instances in which various organizations have checked up on the resale prices of unknown goods and one investigation showed a well-known department store importing a lamp from one of the foreign countries, has made 1500 per cent on the price which the lamp actually cost them. Mr. Kelly deplored the large chain systems, particularly those in which the headquarters are located in some large outside center as in this case. Money which should remain in the community to develop the community itself was doubtless being poured into the large centers and consequently stores of this type were a detriment to the community in which they were located.

He gave figures showing the percentage of business being carried on by the retail druggists and department stores of the country and predicted that within a few more years at the present rate of growth the local retailer would be forced out of business. He then raised the question as to what our young people were to do when they grew up, for a great many of them would have no opportunity whatever to go into business for themselves.

Mr. Kelly's talk throughout stressed "Equal rights to all and special privileges to none."

It has been stated that if a bill such as the Fair Trade Bill should be passed that a manufacturer could set his own price and make the price entirely too high for the value of the product itself. However, if a manufacturer should proceed on this basis he would simply add to the business of his competitor who makes an article of equal value but would sell it at a lower price. Mr. Kelly spoke of the work that the Federal Trade Commission at Washington is now doing and stated that anyone interested in this legislation should write to this Commission and ask for the "Second Questionnaire on the Resale Price question." It is expected that this questionnaire will be ready within a few days.

A final place for coöperation was given and Mr. Kelly felt that the best results could be obtained by getting into personal touch with ones own congressman.

Various members in the audience joined in the open discussion which followed Mr. Kelly's presentation and among those who spoke was Henry Bauerfind of Fort Wayne, Ind. Mr. Bauerfind is a wholesale druggist and happened to be in Washington in the interests of this bill and when he found that Mr. Kelly was coming to Philadelphia to speak on the subject he joined him at once.

At the close of the meeting Mr. Kelly was given a rising vote of thanks and a hearty round of applause.

About 50 members of the two organizations joined in the usual dinner at the Touraine Apartments Restaurant earlier in the evening.

The meeting was adjourned at a late hour.

ADLEY B. NICHOLS, *Secretary.*

UNIVERSITY OF WASHINGTON.

The regular monthly meeting of the University of Washington Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 27th, at Bagley Hall, President Richards presiding. The first speaker of the evening was Mr. L. D. Bracken of the Bracken Prescription Pharmacy, Seattle, who gave a talk on the work of a prescription pharmacist. According to Mr. Bracken one of the big problems that confronts the dispenser is the recognition and modification of incompatibilities. He emphasized the necessity of a detailed study of that subject. A second rather inclusive subject that required study and preparation was that coming under the general name of New Remedies, or new names of old remedies as is often the case. The pharmacist must be in a position to give the physician the necessary information relative to these new medicines. To be able to do this Mr. Bracken strongly recommended the reading of scientific literature and journals. "Only by constant study and reading can a pharmacist

keep up with the present trend of medicine," Mr. Bracken stated. The second participant in the evening's program was Mr. Norman, of Parke, Davis & Co., who presented two reels of moving pictures illustrating the manufacture of biologicals.

H. A. LANGENHAN, *Secretary.*

UNITED STATES CIVIL SERVICE EXAMINATION.

The United States Civil Service Commission announces the following open competitive examination:

Applications for chief of drug control must be on file with the Civil Service Commission at Washington, D. C., not later than March 27th.

The examination is to fill a vacancy in the Food, Drug and Insecticide Administration, Department of Agriculture, Washington, D. C., and vacancies occurring in positions requiring similar qualifications.

The entrance salary is $5200 a year. A probationary period of six months is required; advancement after that depends upon individual efficiency, increased usefulness and the occurrence of vacancies in higher positions.

The duties are primarily administrative. The Chief of Drug Control must direct the work involved in enforcing the terms of the Federal Food and Drugs Act as they apply to drugs and medicines. This involves not only the supervision of the personnel of the Drug Control Unit, consisting of approximately 22 people, including medical officers, chemists and pharmacologists, but also responsibility for the operations of the field force in applying the law to interstate shipments of drug products. His primary business will be a determination of the policy to be adopted in the law enforcement work on drugs, the particular projects to be engaged in during any specific period, to determine what cases are sufficiently flagrant to warrant prosecution and to maintain contact with the latest developments in the drug manufacturing industry and in medical science. There will be a great many direct contacts with representatives of the industry itself, requiring a display of tact, firmness and good judgment, so that it is essential that a man of strong personality be secured.

Competitors will not be required to report for a written examination at any place, but will be rated on their education, training and experience.

Full information may be obtained from the United States Civil Service Commission at Washington, D. C., or the Secretary of the United States Civil service board of examiners at the post office or customhouse in any city.

FOREIGN EXHIBITS.

The *Journal of the American Medical Association* states that an allotment of $2000 has been made by the U. S. Treasury Department of the public health service for the preparation of an exhibit to be used at the International Exhibition at Seville, Spain, that will be held in October 1928. The U. S. Government is participating in this exposition, and all of the government departments and bureaus will be represented. The exhibit of the public health service that is being prepared includes the subjects of smallpox vaccination, venereal diseases, tularemia, safe water and other miscellaneous items.

As the Government seeks to develop U. S. industries and laboratories (bring research work of this country to the attention of other nations) displays of pharmaceutical products and of the Standards—the U. S. P. and N. F., according to which they are made—seem right in line with the contemplated exhibit.

THE COMING MEETING OF GERMAN SCIENTISTS AND PHYSICIANS.

The meeting of German scientists and physicians in Hamburg this year is set for September 16th. The main topics on the program are: The Importance of Wöhler's Synthetic Production of Urea;[1] the Scientific Effects of Meteoric Showers; Telephotos, or Telephony with Very Short Waves; Problems of Coal Liquefaction; Fermentation and Respiration; from the field of the natural sciences; Naegeli's Theory in Relation to the Mechanics of Waves; from the field of medicine; Sleep, Dreams, Hypnosis, etc.; Sexual Hormones; the Appearance and the Disappearance of Epidemics. An exhibit in the fields of medicine and the natural sciences will be organized.

[1] 1828. Wöhler was for a time an Inspector of Pharmacies.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1927–1928.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 9.

To the Members of the Council: February 23, 1928.

66. Site for Headquarters Building in Washington, D. C. The following letter has been received:

Baltimore, Md., February 23, 1928.

E. F. Kelly, Secretary,
AMERICAN PHARMACEUTICAL ASSOCIATION,
Baltimore, Md.

Dear Secretary Kelly:

I am bringing to your attention certain information respecting the selection of a site for the Pharmacy Haedquarters Building in Washington, which I request that you submit to the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION, with the request that they authorize our Committee to proceed with the purchase of the site which we have selected, Lots 3, 4 and 5, Square 62, on the new Mall in Washington. These lots were purchased in my name, on the payment of $5000.00 on January 16th, of this year, to avoid the loss of our option, which expired on the aforementioned date, especially in view of the fact that another purchaser had acquired an option, beginning on the 17th of January, and was anxious to have the property.

This property was purchased at a cost of $6.09 per square foot, or thereabout and, considering the location from all viewpoints, including desirability for our purposes, is extraordinarily cheap at the price. The site is directly opposite the Lincoln Memorial, in line with and across the street from the National Academy of Sciences. It is surrounded by parks and institutions of the most impressive and highly ethical and scientific character. The site is ideal. Borings have been made on the ground to determine the nature of the soil for building purposes and an entirely satisfactory report has been received. The price of the property is $92,500.00 $5000.00 of which, as has been before stated, being paid by myself as a part of my $10,000.00 subscription to the cost of the site, which has no relation to any other subscriptions which I have made. The remainder, $87,500.00, is due on March 1st and I recommend that the Council approve the payment of this amount out of the Pharmacy Headquarters Building Fund, which we have in the Drovers and Mechanics National Bank, especially in view of the fact that James W. Wescott, G. A. Pfeiffer and A. R. L. Dohme, have also promised to subscribe $10,000.00 each towards the purchase of this site, but no other. Our Committee is convinced that other ten thousand dollar subscriptions to the cost of the site will be obtained.

As you know, prompt action on this recommendation is required, for final settlement is due on March 1st.

Yours very truly,
(Signed) H. A. B. Dunning,
Chairman, Committee on Site.

(*Motion No. 27.*) *It is moved by Hilton that the Chairman of the Committee on Site, the Treasurer and Secretary of the Association be authorized to complete the purchase of Lots 3, 4 and 5 of Square 62, Washington, D. C. in accordance with the letter from Chairman Dunning and that title to this property be taken in the name of the American Pharmaceutical Association.*

By direction of the Chairman of the Council a vote on this motion is called for at this time and the members of the Council are requested to return their vote promptly.

E. F. KELLY, *Secretary.*

LETTER NO. 10.

March, 1, 1928.

To the Members of the Council:

67. Place and Date of the Next Annual Meeting. Motion No. 21 (See Council Letter No. 6, page 201) has been carried and the meeting will be held at Portland, Me., the week of Aug. 20-25, 1928 with the Eastland Hotel as headquarters.

68. Election of Local Secretary. Motion No. 22 (See Council Letter No. 6, page 201) has been carried and Mr. E. F. Carswell of Gorham, Me. has been notified of his election.

69. Election of Members. Motion No. 24 (See Council Letter No. 6, page 202) and *Motion No. 25* (See Council Letter No. 6, page 203) have been carried and applicants for membership numbered 112 to 128 inclusive, and applicants for membership numbered H-492 to H-596, inclusive, are declared elected.

70. Resolutions on the Death of Caswell A. Mayo. Chairman Hilton has appointed, Charles G. Merrell, Chairman, Cincinnati, Ohio, H. V. Arny, New York, N. Y., Reginald E. Dyer, New York, N. Y., as a committee to draw up suitable resolutions on the death of Ex-President Mayo.

71. Report of the Auditors. The following report has been submitted:

Mr. C. W. Holton, Treasurer,
AMERICAN PHARMACEUTICAL ASSOCIATION,
Baltimore, Md.

Dear Sir:

I have made an examination of the books and accounts of the AMERICAN PHARMACEUTICAL ASSOCIATION and your report, as Treasurer, for the calendar year 1927, and I HEREBY CERTIFY that the total Cash and Securities on hand at December 31, 1927, amounting to $388,747.09 is correctly stated.

I have also examined the record maintained by the Secretary of the ASSOCIATION and have traced the transfer of funds from his account to that of the Treasurer.

Receipts by the Editor of the JOURNAL, as disclosed by his report to the ASSOCIATION, have been checked to the funds of the Treasurer, and have been found correctly stated.

All cash receipts have been traced to deposits in bank to the credit of the respective funds for which received, and all disbursements have been found evidenced by properly authorized voucher checks.

Balances on deposit with the various Banks have been reconciled with Certificates from the Depositories, and Investment Securities held by the ASSOCIATION have been examined and found to be in agreement with accounts shown by the records.

During the year changes in investments have been made, all purchases and sales having been authorized by "The Council" and shown by the "Minutes" in the hands of the Secretary.

Respectfully submitted,
February 15, 1928. (Signed) W. A. Johnson,
Certified Public Accountant.

In order that the members of the Council and others interested may be informed, the following data is quoted from the Treasurer's Report for the year.

TREASURER'S REPORT, JANUARY 1 TO DECEMBER 31, 1927.

BALANCE AND RECEIPTS.

Balance:		
Cash in Merchants & Manufacturers National Bank, Newark, N. J.	$ 1,041.77	
Cash in Boston Penny Savings Bank	291.98	
Cash in Balto. Trust Co. (Secretary's Account)	13,823.94	
Total cash balance January 1, 1927		$ 15,157.69

Receipts:

For the Current Fund:

From the Secretary (see account attached)	$41,987.04	
Balance in Secretary's Account	2,293.62	
Interest on deposit Boston Penny Savings Bank	13.26	
Interest on deposit Merchants and Newark Trust Co	235.05	
Interest on Headquarters Building Fund	9,470.44	53,999.41
For the Permanent Funds:		
Endowment	481.22	
Centennial	166.01	
Ebert Legacy	273.89	
Ebert Prize	44.64	
Life Membership	1,383.86	
Research	13,442.13	
Headquarters Building	52,793.15	68,584.90
For the Trust Funds:		
Wm. Procter, Jr., Monument	584.06	
J. P. Remington Honor Medal	50.44	634.50
Total receipts		$123,218.81
Total Balance and Receipts		$138,376.50

DISBURSEMENTS AND BALANCE.

From the Current Fund:

General Expenses:	Budget Appropriations.	Budget Disbursements.
Salaries	$ 11,167.67	$ 10,866.64
Rent	1,020.00	1,020.00
Telephone	80.00	102.67
Clerical Expenses Secretary's Office	1,300.00	1,304.76
Printing, Postage and Stationery	1,200.00	1,243.02
Traveling Expenses	750.00	787.09
Stenographers	350.00	
Premium on Bonds	60.00	50.00
Auditing	80.00	75.00
Certificates	50.00	9.00
Miscellaneous Expenses	200.00	208.95
Section on Scientific Papers	25.00	29.62
Section on Education and Legislation	25.00	8.82
Section on Practical Pharmacy and Dispensing	25.00	24.43
Section on Commercial Interests	25.00	18.82
Section on Historical Pharmacy	25.00	6.60
Committee on Local Branches	25.00	
Committee on Membership	300.00	307.19
Committee on Unofficial Standards	100.00	
Committee on State and National Legislation	50.00	
Committee on Syllabus	50.00	50.00
National Drug Trade Conference	200.00	
Drug Trade Bureau of Public Information	400.00	400.00
International Pharmaceutical Federation	120.00	
Metric Association	10.00	

Survey of Commercial Pharmacy		500.00	
Headquarters Building Campaign		9,000.00	9,297.31
Year Book		4,500.00	4,416.58
National Conference on Pharmaceutical Research		20.00	20.00
Committee on Colored Glass Containers		50.00	57.06
Total Appropriations for General Expenses		31,707.67	
Total Disbursements for General Expenses			30,303.56
Open Accounts:			
Journal		11,000.00	14,042.34
National Formulary		1,000.00	8,389.38
Recipe Book		1,000.00	95.08
Badges and Bars		50.00	30.00
Total Budget Appropriations		44,757.67	
Total Budget Disbursements			52,860.36
Transfer of one-half net profits of National Formulary 1925–1926 to Research Fund			12,177.09
Total Disbursements from Current Fund by Voucher Check			65,037.45
From the Permanent Funds:			
Endowment, Accrued interest	$ 15.99		
Ebert Legacy, Accrued Interest	8.00		
Ebert Prize, Accrued Interest	50.54		
Life Membership, Accrued Interest	34.65		
Research, Accrued Interest	58.63		
Research, Reprints	10.04		
Research, Expenses	5.08		
Research, Award	75.00		
Research Award	100.00		
Research, Nat. Conference Pharmaceutical Research	20.00		
Headquarters Building, Charge for unpaid checks, Drovers & Mechanics Nat. Bank	40.00		
Headquarters Building, Transfer of interest to checking account	9,470.44		
Total Disbursements from Permanent Funds by Voucher Checks and Charge		9,888.37	
Total Disbursements by Transfer of Permanent Funds		58,696.53	68,584.90
From the Trust Funds:			
Procter Monument, Accrued interest	15.99		
Total Disbursements from Trust Funds by Voucher Check		15.99	
Total Disbursements by Transfer of Trust Funds		618.51	634.50
Total Disbursements			$134,256.85
Balance:			
Cash in Merchants & Newark Trust Co.		1,520.79	
Cash in Boston Penny Savings Bank		305.24	
Cash in Balto. Trust Co. (Secretary's Account)		2,293.62	
Total Balance December 31, 1927			4,119.65
Total Disbursements and Balance			$138,376.50

Comparison of Funds:

Current Fund:	Dec. 31, 1926.	Dec. 31, 1927.
Cash in Merchants & Manufacturers Nat. Bank	$ 1,041.77	
Cash in Merchants & Newark Trust Co.		1,520.79
Cash in Boston Penny Savings Bank	291.98	305.24
Cash in Baltimore Trust Co. (Secretary's Account)	13,823.94	2,293.62
Total Current Fund	15,157.69	4,119.65
Permanent Funds:		
Endowment Fund	$ 11,543.58	$ 12,008.81
Centennial Fund	4,490.79	4,656.80
Ebert Legacy Fund	6,556.54	6,822.43
Ebert Prize Fund	1,143.09	1,137.19
Life Membership Fund	33,213.72	34,562.93
Research Fund	30,060.34	43,233.72
Headquarters Building Fund	223,861.29	267,144.00
Total Permanent Funds	310,869.35	369,565.88
Trust Funds:		
Wm. Procter, Jr., Monument Fund	13,163.96	13,732.03
Jos. P. Remington Honor Medal Fund	1,279.09	1,329.53
Total Trust Funds	14,443.05	15,061.56
Summary of Funds:		
Current Fund	15,157.69	4,119.65
Permanent Funds	310,869.35	369,565.88
Trust Funds	14,443.05	15,061.56
Total Funds	340,470.09	388,747.09

Summary of Assets and Trust Funds:

	Dec. 31, 1924.	Dec. 31, 1925.	Dec. 31, 1926.	Dec. 31, 1927.
Current Fund	$ 16,728.06	$ 5,280.72	$ 15,157.69	$ 4,119.65
Permanent Funds	182,379.54	258,075.29	310,869.35	369,565.88
Total Assets	199,107.60	263,356.01	326,027.04	373,685.53
Trust Funds	13,436.69	13,915.35	14,443.05	15,061.56
Total Funds	212,544.29	277,271.36	340,470.09	388,747.09

72. Recipe Book. Motion No. 26 (See Council Letter No. 7, page 204) has been carried.

A meeting of the Sub-Committee on Scope of the Committee on Recipe Book was held at the New York College of Pharmacy on Tuesday and Wednesday, February 14th and 15th, in accordance with Motion No. 26. In addition to the members of the Sub-Committee, Messrs. Lascoff, Griffith, Scoville, Hilton, Fischelis and Wimmer, Former Chairman Raubenheimer, Editor Eberle, Chairman DuMez of the Committee on Publications and Secretary Kelly attended the meeting. Dr. Lascoff acted as Chairman and Prof. Griffith as Secretary.

The progress of the Recipe Book was reviewed and the text studied in considerable detail. It was decided to delete assay processes, extracts, fluidextracts, wines and, in general, therapeutic terms and statements from the text and to include introductory chapters to certain important groups of preparations for which such chapters had not been provided. The inclusion of a statement of the average alcoholic content of preparations was considered but was not thought to be feasible at this time.

A more complete classification of preparations was worked out and other details such as English and Latin titles, distinctive titles for preparations employed for similar purposes, the ar-

rangement of formulas, the wording of directions, etc., were given attention, and the Editor was authorized to make such other corrections in the text as is necessary in order to bring about uniformity.

Page proofs will be issued as soon as possible and, although no exact date could be set, it is expected that the Recipe Book will be ready for distribution in from three to four months.

73. Site for Headquarters Building. Motion No. 27 (See Council Letter No. 9) has been carried. Sixteen votes were in the affirmative and one member has not voted.

On Wednesday, February 29, 1928, Treasurer Holton and Secretary Kelly completed the purchase of Lots 3, 4 and 5 in Square 62, Washington, D. C., and the deed for the property is being recorded in the name of the AMERICAN PHARMACEUTICAL ASSOCIATION. Chairman Hilton of the Council also took part in the settlement.

The title was guaranteed by the District Title Insurance Company and the total expenses of the settlement, including adjustment of taxes, insurance, etc., amounted to $344.48.

Since the issuance of Council Letter No. 9, subscriptions of $10,000.00 each to the purchase of this site have been received from Mr. J. K. Lilly and Mr. Henry S. Wellcome. Other subscriptions are expected.

74. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 129, Arthur C. Bannon, Attorney, L. C. Smith Bldg., Seattle, Wash.; No. 130, Edgar Kurtz Braselton, 1760 Euclid St., N. W., Washington, D. C.; No. 131, William Paul Briggs, 2013 New Hampshire Ave., N. W., Washington, D. C.; No. 132, Eugene C. Brokmeyer, 1095 National Press Bldg., Washington, D. C.; No. 133, A. E. Poonin, 801 N. 63rd St., Philadelphia, Pa.; No. 134, Hazel Mond Chilton, Box 549, Kingman, Ariz.; No. 135, Jack William Codling, 1022 W. Armour St., Seattle, Wash.; No. 136, Jas. B. Connell, Chapel Hill, N. C.; No. 137, Eugene Carroll Coughlin, 180 Water St., Augusta, Me.; No. 138, Fred J. Creutz, Wausa, Nebr.; No. 139, John Holt Crittenden, Crewe, Va.; No. 140, Besse Crombie, 4045 Brooklyn Ave., Seattle, Wash.; No. 141, Isidore Cukell, 1697 Macombs Road, New York, N. Y.; No. 142, Ray R. Douglass, Postville, Iowa; No. 143, Thaddeus J. Embrey, 1241 Irving St., N. W., Washington, D. C.; No. 144, B. Eskin, 1534 No. 6th St., Philadelphia, Pa.; No. 145, Samuel Alvin Etzel, 1218 Mt. Royal Ave., Baltimore, Md.; No. 146, Richard Dominic Franklin, 334 Douglas Ave., Providence, R. I.; No. 147, Francis Augustus Frawley, 178 Ceder St., Bangor, Me.; No. 148, Harry E. Goodrich, 245 Water St., Augusta, Me.; No. 149, John N. Harvard, Jr., 195 Exchange St., Rochester, N. Y.; No. 150, Paul Willard Heckman, 138 N. Main St., Nazareth, Pa.; No. 151, Ted S. Hough, Snoqualmie, Wash.; No. 152, Louis D. Humphrey, c/o The Harvey Co., Saratoga Springs, N. Y.; No. 153, Dr. José E. Jiminez, 835 San Fernando St., Manila, P. I.; No. 154, Ivor Jones, Route No. 3, Box No. 1 D, Seattle, Wash.; No. 155, W. H. Keen, Chief Pharmacist, U. S. Marine Hospital No. 82, Norfolk, Va.; No. 156, Gertrude S. Kellicott, Ohio State University Library, Columbus, Ohio; No. 157, Walter Clinton Lewis, Chapel Hill, N. C.; No. 158, Leon Herbert Marr, 62–66 Main St., Farmington, Mo.; No. 159, George W. Mathes, 344 Mohawk Ave., Scotia, N. Y.; No. 160, David L. Maxwell, 1801 I St., N. W., Washington, D. C.; No. 161, John F. Miller, Cedar and Hamilton Aves., Cincinnati, O.; No. 162, Morris Pleskow, 150 York St., New Haven, Conn.; No. 163, Leonard Erastus Reaves, Jr., Box 362, Chapel Hill, N. C.; No. 164, John Gregory Rickets, c/o Dispensary Schofield Sta. Hospital, Oahu Island, Hawaii; No. 165, Phyllis Zarpentin Sanders, California College of Pharmacy Library, Parnassus and First Aves., San Francisco, Calif.; No. 166, Ray L. Saucier, 208 Lisbon St., Lewiston, Me.; No. 167, Daniel W. Sexton, 240 Water St., Augusta, Me.; No. 168, Frank Ambrose Shimkus, 3301 So. Halsted St., Chicago, Ill.; No. 169, Herman C. Shuptrine, 1604 Morrison Ave., Tampa, Fla.; No. 170, Manning Arthur Starkman, North Pacific College, Portland, Ore.; No. 171, Edward Swallow, 332 North High St., Mount Vernon, N. Y.; No. 172, Irving A. Tennyson, 1801 I St., N. W., Washington, D. C.; No. 173, George Lewis Webster, 715 S. Wood St., Chicago, Ill.; No. 174, W. E. Welch, 301 E. First St., Dayton, Ohio.

(*Motion No. 28.*) Vote on applications for active membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

75. Applicants for Membership on Account of Contributions to the Headquarters Building Fund. The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to

membership and you are requested to vote on the applications which have been properly endorsed.

H-597, Irene Boris, 1934 E. 81st St., Cleveland, Ohio; H-598, William Robert Curran, 1383 6th Ave., San Francisco, Calif.; H-599, Carroll Atlee W. Dayharsh, 105 Kensington Place, Syracuse, N. Y.; H-600, Carmelita de Lalla, 1959 63rd St., Brooklyn, N. Y.; H-601, H. A. Dinges, 2710 Arlington Ave., St. Louis, Mo.; H-602, Walter Frank Dreis, 465 St. Peter St., St. Paul, Minn.; H-603, Charles H. Gaer, 641 Lafayette Ave., Brooklyn, N. Y.; H-604, Albert John Genetelli, 613 14th St., Union City N, J.; H-605, Fred Halpin, 952 Fox St., New York, N. Y.; H-606, Charles Heller, 1059 Louisa St., Elizabeth, N. J.; H-607, William Cornelius Frederick Hogle, 176 E. 81st St., New York, N. Y.; H-608, Edward Preston Holloway, 2 Broadway, Denver, Colo.; H-609, C. H. Johnson, Churdan, Iowa; H-610, Lester Vaughn Jones, 4176 E. 114th St., Cleveland, O.; H-611, John James Kominakis, c/o University of Valparaiso, Valparaiso, Ind.; H-612, Henry Kusinitz, 325 Wallabout St., Brooklyn, N. Y.; H-613, Morris Lang, 2434 W. Division St., Chicago, Ill.; H-614, Raymond Nathan Margolies, 258 Wadsworth Ave., New York, N. Y.; H-615, Pasquale Sevevino, 938 B. 4th Ave., Brooklyn, N. Y.; H-616, David John Sweeney, 614½ N. Main St., Rochelle, Ill.; H-617, Peter Tavolacci, 1829 Hone Ave., New York, N. Y.

(*Motion No. 29.*) Vote on applications of contributors to the Headquarters Building Fund for Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

JOINT MEETING OF COLLEGES OF PHARMACY AND BOARDS OF PHARMACY OF N. A. B. P. DISTRICT NO. 2 (NEW YORK, NEW JERSEY, PENNSYLVANIA, DELAWARE, MARYLAND, DISTRICT OF COLUMBIA), HELD AT HOTEL EMERSON, BALTIMORE, MARYLAND, MONDAY AND TUESDAY, MARCH 5-6, 1928.

PROGRAM.

Monday Morning Session.

11.00 A.M. Call to order by the respective chairmen.
Election of a secretary.
Roll Call of Boards and Colleges.
Statement of the objects and purposes of the meeting by Messrs. Richardson and Saalbach.
Greeting from the National Association of Boards of Pharmacy by President A. C. Taylor.
Appointment of Committee on Recommendations.

Monday Afternoon Session.

2.00 P.M. Discussion of the Charters Report with respect to what subjects should be added to the Pharmacy curriculum.
A. G. DuMez for the Colleges of Pharmacy.
H. C. Christensen for the Boards of Pharmacy.

3.00 P.M. Discussion of the questions in Pharmaceutical Chemistry, submitted by the New York Board of Pharmacy.
Prof. Koch, University of Pittsburgh.
Prof. Little, New Jersey College of Pharmacy.
Members of Board submitting questions.

4.00 P.M. Discussion of the questions in Materia Medica, submitted by the Delaware Board of Pharmacy.
Columbia University.
Prof. Plitt, University of Maryland.
Members of Board submitting questions.

Tuesday Morning Session.

9.30 A.M. Discussion of the question in Pharmacy, submitted by the Maryland Board of Pharmacy.
Prof. LaWall, Philadelphia College of Pharmacy and Science.
Prof. Anderson, Brooklyn College of Pharmacy.

Members of Board submitting questions.

11.00 A.M. Discussion of the questions in Practical Pharmacy submitted by the Boards of Pharmacy of Pennsylvania and the District of Columbia.
Prof. Cook, Philadelphia College of Pharmacy and Science.
Prof. Gregory, Buffalo College of Pharmacy.
Members of Board submitting questions.

Tuesday Afternoon Session.

2.00 P.M. Discussion of the questions in Pharmaceutical and Chemical Mathematics submitted by the New Jersey Board of Pharmacy.
Prof. Sturmer, Philadelphia College of Pharmacy and Science.
Prof. Burdine, George Washington University.
Members of Board submitting questions.

3.00 P.M. Formulation of joint recommendations based on the preceding discussions.

RESOLUTION ON PUBLIC HEALTH BILL AND COMMISSION FOR PHARMACISTS ADOPTED.

WHEREAS it has come to the attention of the members of the State Boards of Pharmacy and the representatives of the Colleges of Pharmacy in the states of New York, Pennsylvania, Delaware, New Jersey, Maryland and the District of Columbia, assembled in conference in Baltimore on March 5th and 6th, that a bill has been introduced in the respective houses of Congress which will give commissions to pharmacists in the U. S. Public Health Service who are performing duties comparable to those of other professional and scientific officers and whereas this group of educators and board members believes that this recognition of the importance of the duties of the pharmacist is both proper and desirable therefore

Be It Resolved that the representatives present at this Conference endorse and urge the passage of this legislation House Bill No. H R 11026 and Senate Bill No. S 3356, and

Be It Further Resolved that it is the hope of this group that in the appointment of the National Advisory Health Council provided for in this legislation, there be included at least one pharmacist, and

Be It Further Resolved that this resolution be brought to the attention of the House and the Senate.

The Bill passed the House March 7th. Report of Joint Meeting will be made in next issue of the Journal.

UNWARRANTED STATEMENTS RELATIVE TO PHARMACY IN MAGAZINES, BOOKS AND ADDRESSES.

Recently in a book and, at least, in one magazine and in an address by a jurist, the druggist has not received rightful consideration. Speaking on birth control, Judge Lindsey is reported by the press to have said: "Let it be put in the hands of proper scientific direction, instead of the present system of corner drug store bootlegging."

Judge Lindsey probably knows the pharmacist on whom he depends for medicines and would hardly admit that this individual is deserving of the term he used. It is admitted that every one in the drug business does not measure up to the high standard of the A. PH. A. code of ethics, but when terms are generally applied by word or print, efforts should be made to inform the writers and speakers of their errors. It is very necessary that the highest standard of professions be maintained and a corresponding respect be accorded them.

Opportunity is taken at this time to add a word against the use of the title of "Chemist" to "druggist" or "pharmacist" This is the custom in England but differentiation between pharmacist, druggist and apothecary is sufficiently difficult without adding another title. If used, a definition of the term should be included in pharmacy laws. Is the application an attempt to use a term that would permit drugless drug stores?

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, GEO. M. BERINGER, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* C. W. JOHNSON, *President;* AMBROSE HUNSBERGER, JOSEPH JACOBS, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* LEONARD SELTZER, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; W. L. SCOVILLE, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; L. W. ROWE, M. N. FORD, ADLEY B. NICHOLS, C. LEONARD O'CONNELL, W. P. PORTERFIELD; EDWARD SPEASE, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; A. C. TAYLOR, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

NEW AND NONOFFICIAL REMEDIES.

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

DEXTROSE (See New and Nonofficial Remedies, 1927, p. 220).

The following dosage form has been accepted:

Sterile Solution of Dextrose (d-Glucose) 50 cc. Double End Vial: Each vial contains Dextrose, U. S. P., 25 Gm.; cresol, 0.1 per cent; distilled water, to make 50 cc.; buffered with diabasic sodium phosphate anhydrous, 0.44 per cent and potassium biphosphate anhydrous, 0.072 per cent.
Prepared by H. K. Mulford Company, Philadelphia.

CAPROKOL (Hexylresorinol-S. & D.) (See New and Nonofficial Remedies, 1927, p. 320).

The following dosage form has been accepted:

Hexylresoricinol Solution S. T. 37: A solution of hexylresorcinol-S. & D., 1 part, in a liquid composed of glycerin 30 per cent and water 70 per cent, 1000 parts.

ILETIN (INSULIN-LILLY) (See New and Nonofficial Remedies, 1927, p. 198).

The following dosage form has been accepted:

Iletin (Insulin-Lilly) U-100, 10 cc.: Each cubic centimeter contains 00 units.

Jour. A. M. A., January 28, 1928.

LIVER EXTRACT NO. 343.—A water-soluble, nitrogenous, nonprotein fraction obtained from fresh mammalian liver. It is supplied in vials containing an amount of powdered extract (3 to 4 Gm.) representing 100 Gm. of fresh liver.

Actions and Uses.—Liver extract No. 343 is used in the treatment of pernicious anemia. Only preliminary observations have been made concerning its value in conditions other than pernicious anemia; apparently it is of value in some other types of anemia, but definitely seems to be of little or no value in many cases of ordinary secondary anemia.

Dosage.—Liver extract No. 343 is administered orally, the contents of one vial being dissolved in about 30 cc. (1 fluidounce) of water, orange juice or other vehicle. Exact knowledge concerning the daily dose is yet to be determined. Many patients have improved promptly while taking daily the contents of three vials of liver extract No. 343, but as a rule not so rapidly as other patients taking double this amount. The optimum daily dosage appears to be the contents of from six to eight vials. Very large amounts have been given for some days without causing untoward consequences, but may possibly stimulate the blood-forming organs to an undesirable degree.

It may be advisable to give daily to very sick patients the contents of eight vials for the first ten days, after which time the amount may be reduced. As an initial daily dose for the average case, the contents of three to six vials is proposed. This amount is to be taken until the number of red blood cells returns to normal. The maintenance dose required has not yet been determined, but it appears that the use of the extract (or of liver) must be continued to prevent relapse. For the present it is advised that the contents of two or three vials be taken daily and that the patient and his blood be examined at intervals of a month so that the maintenance dose required by the patient may be determined.

Manufactured by Eli Lilly & Company, Indianapolis, under direction of the Committee on Pernicious Anemia of the Harvard Medical School. No U. S. patent or trademark.

To prepare liver extract No. 343, livers from edible animals are ground directly into water, and the mixture adjusted to the isoelectric point (approximately p_H 5 to p_H 6). The mixture is then heated to coagulate protein (approximately 80 C.); stirred for thirty minutes, and filtered. The filtrate is reduced in vacuum to a small volume and enough 95 per cent alcohol added to produce a concentration of 70 per cent. The precipitate which is formed is discarded and the filtrate reduced to a small volume; added to absolute alcohol and the precipitate separated, dried in vacuum and powdered.

Liver extract No. 343 is a yellow powder having a not unpleasant taste, almost entirely soluble in water. It is precipitated from the aqueous solution by alcohol and acetone. It is insoluble in ether.

From *Jour. A. M. A.*, Feb. 4, 1928.

CALCREOSE (See New and Nonofficial Remedies, 1927, p. 123).

The following dosage form has been accepted:

Compound Syrup of Calcreose.—A syrup containing in 100 cc. calcreose solution, 33.3 cc.; alcohol, 5 cc.; extractives from wild cherry, 4 Gm. (20 grains per fluidounce); chloroform, 0.6 cc. (3 minims per fluidounce); peppermint and other aromatic drugs.

Dosage.—Four to 8 cc. (1 to 2 fluidrachms).

ANTERIOR PITUITARY DESICCATED-LEDERLE.—The anterior lobe of the pituitary gland of cattle, dried and powdered, without the addition of preservative or diluent.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1927, p. 285.

Dosage.—From 0.13 to 0.3 Gm. (2 to 5 grains) three times a day.

Manufactured by the Lederle Antitoxin Laboratories, New York. No U. S. patent or trademark.

Tablets Anterior Pituitary Desiccated-Lederle, 2 grains.

Tablets Anterior Pituitary Desiccated-Lederle, 5 grains.

The fresh glands are freed of extraneous matter, finely ground, spread on glass plates and dried rapidly in a current of warm air. Anterior pituitary desiccated-Lederle is grayish powder with slight characteristic odor. One part represents approximately 5 parts of fresh substance.

From *Jour. A. M. A.*, Feb. 11, 1928.

POSTERIOR PITUITARY DESICCATED-LEDERLE.—The posterior lobe of the pituitary gland of cattle, extracted with acetone, dried and powdered.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1927, p. 285.

Dosage.—From 0.006 to 0.03 Gm. ($^1/_{10}$ to $^1/_2$ grain) daily.

Manufactured by the Lederle Antitoxin Laboratories, New York. No U. S. patent or trademark.

Tablets Posterior Pituitary Desiccated-Lederle, $^1/_{10}$ grain.

Posterior pituitary desiccated-Lederle is prepared according to the method given for standard powdered pituitary under Solution of Pituitary, U. S. P. X.

WHOLE PITUITARY DESICCATED-LEDERLE.—The pituitary gland of cattle, including the infundibulum and the anterior and posterior lobes, dried and powdered, without the addition of preservative or diluent.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1927, p. 285

Dosage.—From 0.06 to 0.2 Gm. (1 to 3 grains) three times a day.

Manufactured by the Lederle Antitoxin Laboratories, New York. No U. S. patent or trademark.

Tablets Whole Pituitary Desiccated-Lederle, 1 grain.

Tablets Whole Pituitary Desiccated-Lederle, 3 grains.

The fresh glands are freed of extraneous matter, finely ground, spread on glass plates and dried rapidly in a current of warm air. Whole pituitary desiccated-Lederle is a grayish powder with slight characteristic odor. One part represents approximately 5 parts of fresh substance.

From *Jour. A. M. A.*, Feb. 18, 1928.

CALOT'S SOLUTION.

M. R. Guttman (*"Illinois Medical Journal,"* August 1927) gives the following formula for Calot's solution as used by him in the treatment of chronic otorrhœa: Guiacol, 1 Gm.; creosote, 5 Gm.; ether, 30 cc.; iodoform, 10 Gm.; olive oil, 70 cc.

ESTIMATED PRODUCTION OF BUCHU LEAVES IN THE UNION OF SOUTH AFRICA, 1928.

The production of buchu leaves in the Union of South Africa for the season 1928 will probably be somewhat larger than that of 1927. This estimate indicates that the total yield is somewhat less than 200,000 pounds for the 1928 season. The production of buchu could easily be doubled should prices rise sufficiently to defray the cost of gathering leaves in the more remote hillsides.

PERSONAL AND NEWS ITEMS.

John F. O'Brien is a new President of the Rochester Pharmaceutical Association.

E. A. Sayre, a veteran member of the A. PH. A., was honored by Kings County Pharmaceutical Society and the Brooklyn College of Pharmacy by a delegation of these organizations consisting of Thomas J. France, Henry B. Smith, George R. Christ and Dean William C. Anderson. An embossed set of resolutions was presented to Mr. Sayre, who is now seventy-nine years old and is a charter member of the Society and was one of the organizers of the college and of the ASSOCIATION.

Clyde L. Eddy is a new member of the staff of E. R. Squibb & Sons. His duties will comprise a nation-wide study of conditions applying to both the professional and the commercial aspects of the practice of pharmacy; the iden-

tification of the problems that confront pharmacists and the solution of those problems by the application of practical suggestions, based upon research and long and varied experience.

Last summer Mr. Eddy was at the head of an expedition which successfully negotiated the hazardous 800-mile trip through the Grand Canyon—the only exploring party ever to accomplish this daring feat during the summer time when the Colorado River is in flood. The dangers of this trip and the scenic grandeur of the Canyon's course, viewed from the river level, were photographed in detail and have since been presented to the American public as news-reel features, and in the course of illustrated lectures delivered by Mr. Eddy. A lecture of the course was delivered in Baltimore, March 8th.

More than one million persons visited Field Museum of Natural History during 1927, the largest number in any year of the institution's history. The museum had fourteen expeditions in various parts of the world in 1927.

W. F. Baum, of Danville, a former President of the Illinois Pharmaceutical Association, is spending his usual winter vacation at San Antonio, Texas.

The Membership Committee of the Illinois Pharmaceutical Association is conducting an active membership under the guidance of **Chairman S. L. Antonow.**

P. Henry Utech, of Meadville, **Adolph Schmidt,** of McKeesport and **Jacob Mendelson,** of Pittsburgh, all of Pennsylvania, have recently been sojourning in Florida.

The Pacific Drug Review for March gives quite a complete account of the Oregon Drug Trade Conference and tabulates a survey of nineteen representative Oregon drug stores; also a comparison is made with this survey of operating expenses in retail drug stores in different parts of the country.

Dr. William J. Hale, Director of organic research of the Fow Chemical Company and Past-Chairman of the division of chemistry and chemical technology of the National Research Council, has been appointed Chairman of a committee of the division to foster coöperative researches between industries and academic institutions.

Drs. William J. Mayo and Alexis Carrel were guests of honor at a dinner at the Maryland Club, Baltimore, on January 16th, previous to their addressing the Johns Hopkins University School of Medicine on "The Splenomegalias" and the activities of tissue cells, respectively.

Dr. John Sundwall, professor of hygiene, public health and physical education at the University of Michigan, was elected President of the Michigan Public Health Association at its seventh annual meeting in Lansing on January 13th.

Dr. Sigmund Fraenkel, professor medical chemistry at the University of Vienna, addressed the University of Wisconsin Medical Society on January 12th on "Chemistry of the Vitamins."

The new $1,000,000 Chandler laboratories of Columbia University were formally opened on February 16th, when members of the society of the Sigma Xi inspected them. The laboratories were built with an anonymous gift of $1,000,000 made to the University in honor of the late **Prof. Charles F. Chandler,** who was head of the University's department of chemistry. Dr. Chandler was for more than 60 years a member of the A. PH. A.

Dr. William Crocker, director of the Boyce Thompson Institute for Plant Research, on March 15th, addressed the Columbia University chapter of the Society of Sigma XI on "Research on Plants as Exemplified by the Work of the Boyce Thompson Institute."

F. E. Mortenson, former President of the N. A. B. P. is always active in whatever benefits pharmacy. At present he is Chairman of the legislative committee of the California Pharmaceutical Association and is endeavoring to arouse the pharmacists of California to action on the Capper-Kelly Bill.

J. G. McBride, long-time Secretary of the Nebraska Pharmaceutical Association has been unanimously endorsed as a candidate for the Nebraska Legislature.

A. E. Philips has taken up his duties at New Brunswick, N. J., as Director of Merchandising for Johnson & Johnson. For the past ten years Mr. Philips has been General Sales Manager of The Welch Grape Juice Company and for several years Vice-President and Director.

The interest of pharmacists in historical records is increasing. In all states efforts are being made to gather historical information relative to the first drug stores and the early pharmacists in the respective states.

The Jacksonville Pharmacy in Oregon was established in 1857 and is said to be the oldest drug store of that State. A description of it is given in the *Pacific Drug Review* for March 1928.

The daily report and inspection in the pharmacy of **John A. Goode** in Asheville, N. C. requires the following information from the Manager of the Department: number of new prescriptions filled, number of old prescriptions filled, errors made, sales lost, repairs to be made, any prescription from day before, preparations manufactured, calls for new preparations, scales cleaned by, invoices checked by, sink and drainboard cleaned by, manufacturing counter cleaned by, typewriter cleaned by, time machine charged and cleaned by, small package goods bottled, etc., special items ordered or to be ordered, floor inspected by, do windows need washing? Number of Rx blanks mailed, any prescriptions signed? Remarks and suggestions.

Petty's Pharmacy, Newark, N. J., celebrated the event of a 2,000,000 mark in the filling of prescriptions which was celebrated with a dinner attended by the officers and employees. This establishment lays claim to being the largest retail pharmacy in the U. S.

OBITUARY.

A. MORRIS EARNSHAW.

The death of Arthur Morris Earnshaw was a distinct shock to the people of East Greenwich, Rhode Island. He was in the prime of life and his illness was sudden and his death unexpected. He was highly regarded in the community and during his funeral all business in East Greenwich was suspended. Flags at Varnum Memorial Armory and elsewhere in the city were at half mast.

Mr. Earnshaw was the son of Arthur A. and Bessie M. (Owen) Earnshaw. He died January 2nd at the Homeopathic Hospital, Providence, following an operation for appendicitis.

The deceased was born November 4, 1901, and educated in East Greenwich and also at the Massachusetts College of Pharmacy. He was associated with his father in the Earnshaw Drug Co.

Besides his parents he is survived by his widow, Mrs. Margaret B. Earnshaw and a brother, Elmer R. Earnshaw.

SOCIETIES AND COLLEGES.

SAN FRANCISCO—THE N. A. R. D. CONVENTION CITY.

Secretary W. Bruce Philip and his efficient coöperators are giving fine publicity to the meeting of the N. A. R. D. to be held in San Francisco during the week of September 10th. Railroad rates are so arranged that after attending the San Francisco Convention the delegates may visit other centers of interest on the Pacific Coast and then return by way of another route.

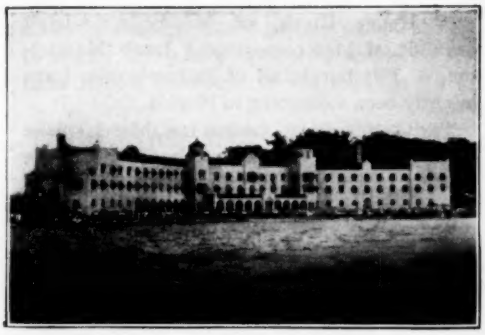
The Committee on Publicity is sending out informative circulars relative to the Pacific Coast Section of the country and is encouraged by many responses from those who contemplate attending the convention in San Francisco.

CENTENARY OF WÖHLER'S DISCOVERY.

Industrial and Engineering Chemistry notes that the year 1928 marks the hundredth anniversary of Wöhler's preparation of urea from ammonium cyanate. That discovery marked the beginning of synthetic chemistry and the beginning of the end of the older vitalistic ideas of organic chemistry. It is planned to celebrate the centenary by a special program at the Boston meeting (Swampscott) of the American Chemical Society in September 1928.

MEETING PLACE OF A. P. M. A.

The American Pharmaceutical Manufacturers' Association will hold its annual meeting at Lake Wawasee, Ind., in June.



MAINE PHARMACEUTICAL ASSOCIATION.

Maine Pharmaceutical Association held its mid-winter meeting February 9th at Augusta. The annual meeting will be held at Poland Spring, June 18th.

MINNESOTA PHARMACEUTICAL ASSOCIATION.

Minnesota Pharmaceutical Association held its annual meeting at the Nicollett Hotel,

Minneapolis, during the week of February 14th. Among the speakers of the Convention were C. T. Heller who spoke on "Legislation," J. T. Woodside of Chicago, spoke on "Planned Selling," George S. Jay of Iowa discussed group advertising.

Dean F. J. Wulling presided over the Scientific Section, which was attended by the members of the Association and the pharmacy student body of the University. President-Elect, D. F. Jones, represented the A. PH. A.

An ownership Law was favored.

Prof. H. J. Ostlund of the University of Minnesota spoke on the "Accounting System for Drug Stores."

The following nominations were made for officers to be elected by mail ballot: *President*, G. A. Thompson, St. Paul and J. B. Tomhave, Montevideo; *Vice-President*, Joseph Vadheim, Tyler and Louis A. Rietz, Easton; *Second Vice-President*, H. O. Tiegen, Moorhead and Miss Jacobi Roes, St. Paul; *Third Vice-President*, N. O. Sanders, Albert Lea and C. E. Willer, Fergus Falls; *Secretary*, Gustav Bachman, Minneapolis and B. A. Walter, St. Paul; *Treasurer*, H. Martin Johnson, St. Paul and John C. Thro, Mankato.

Executive Committee, F. W. Moudry Minneapolis and L. M. Herbert, Washington.

MASSACHUSETTS STATE PHARMACEUTICAL ASSOCIATION MEETING.

The mid-winter meeting of the Massachusetts Pharmaceutical Association was held at the Bancroft hotel, Worcester, on January 30th.

The legislative part of the program was in charge of C. Fred Wright, chairman of that committee, who explained the various proposals so far introduced into the legislature which affect pharmacy. He referred to a proposed measure which would have required that physicians' prescriptions be written in English in triplicate form, and to state specifically for what ailment—real or imaginary—it is intended. The recommendation of the Board of Pharmacy that examination fees be increased was approved, and also the one, introduced by the Association's Board of Directors that the salaries of the Pharmacy Board members be increased.

The Association has introduced two measures of real interest to the pharmacists of the state which received the hearty endorsement of all present. The first is an "Ownership" Bill along the lines of the Pennsylvania law and the other one seeks to limit the sale of proprietary medicines containing certain potent drugs to registered pharmacists.

J. F. Finneran, member of the N. A. R. D. executive committee, spoke on national legislation and affairs in general which affect pharmacy. He emphasized the need of every one getting in touch with members of Congress, letting the members know why pharmacists favor the Capper-Kelly bill and asking for their coöperation. He also gave information relative to the new caustic acid and certain narcotic regulations.

MID-WINTER SESSION OF OHIO PHARMACEUTICAL ASSOCIATION.

The mid-winter session of Ohio State Pharmaceutical Association was held at Dayton March 6th–8th. Among the speakers were: Robert J. Ruth, J. C. Peacock, E. G. Stewart, S. L. Antonow, C. F. Walgreen, A. Kiefer Mayer and Frederick B. Patterson. Further mention of the meeting will be made.

BALTIMORE RETAIL DRUGGISTS' ASSOCIATION.

The annual election of the Baltimore Retail Druggists' Association was held February 9th, resulting in the reëlection of all of the present officers. They are:

President, R. E. Lee Williamson.

Vice-Presidents, S. Y. Harris, William G. Lauer, Howell W. Allen, L. S. Williams, George P. Grau.

Secretary, Melvin Strasburger.

Treasurer, T. J. Boening.

Recording Secretary, William H. Kratz.

The annual dinner of the Association, held on March 8th, was a splendid affair and well attended. President Williamson presided as toastmaster, the Mayor of Baltimore was one of the speakers. A number of Washington pharmacists were in attendance.

NEW YORK RETAIL DRUGGISTS' BANQUET AND DANCE.

The New York Retail Druggists' Association held its annual banquet and ball at the Hotel Commodore on the evening of January 29th. As a social gathering for a genuine good time it will be long remembered by all the members and their friends who were present. Between seven and eight hundred were in attendance, the related branches of the trade and educational institutions being well repre-

sented. President Barrer, in the opening address, welcomed the guests and expressed his indebtedness to the various committees who made the evening a success.

Mr. and Mrs. Pincus Herz celebrated their thirtieth wedding anniversary and added interest to a pleasant occasion. Honorary President Peter Diamond was presented with a walking stick, expressing the appreciation of friends and members of his services.

Dr. Louis I. Harris, head of the Department of Health for New York City delivered a most interesting address. Other speakers were Dr. George C. Diekman, Dr. Jacob Diner, President Sigmund Kopald, of the New York Pharmaceutical Conference and A. Scherl assistant to Sol Herzog, executive director of the Conference.

THIRTIETH ANNIVERSARY OF THE ITALIAN PHARMACEUTICAL ASSOCIATION.

The Italian Pharmaceutical Association, of the State of New York, celebrated its thirtieth anniversary at the Biltmore Hotel, New York City, March 4th. The celebration partook of Sicilian style, the attendance was large and the resplendent occasion a most happy one.

THE NATIONAL SCHOOL OF MEDICINE AND PHARMACY, HAITI.

The National School of Medicine and Pharmacy, Port of Prince, Haiti, recently dedicated its new building. The Rockefeller Foundation made an appropriation of $30,000 for equipment and of another $30,000 for fellowships for men who are to be trained for positions on the faculty.

WISCONSIN PHARMACY STUDENTS AIDED.

Students in the Pharmacy Course of the University of Wisconsin in need of financial assistance will benefit through the generosity of John J. Possehl, a Milwaukee druggist, who has given one thousand dollars to the regents of that institution as a trust fund, the income of which is to be used for the purposes stated. The Board of Regents in accepting this gift voted to designate it as the John J. Possehl Loan Fund for Pharmacy Students. Since repayments of loans are to be added to the principal, it is expected that the original fund will grow as it is used and so eventually reach a larger number than can be aided at the present time.

OFFICERS OF THE PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS.

The new officers of the P. A. R. D. are: *President*, George W. Fehr; *First Vice-President*, J. K. Auginbaugh; *Second Vice-President*, H. E. Maberry; *Third Vice-President*, Leo G. Penn; *Treasurer*, Henry Swain; *Chairman Executive Committee*, Elmer D. Michener.

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE DEDICATES HOME.

The new building of the Philadelphia College of Pharmacy and Science, was formally dedicated on Thursday afternoon, February 23rd, with many men and women in the prominent fields of pharmacy, medicine, science and public life and the alumni present.

The orator of the day was Hon. Hampton L. Carson, President of the Historical Society of Pennsylvania, the Mayor of Philadelphia, in behalf of the city, praised the college for its usefulness.

President Wilmer Krusen, of the college, presided over the exercises which opened with invocation by Rev. J. A. McCallum, and closed with the official transfer of keys from Norman Hulme, architect, to Otto W. Osterlund, Chairman of the Building and Finance Committees, to Dr. Krusen, who turned them over to Deans LaWall and Sturmer. Following the singing of the Alma Mater, instrumental selections were rendered by the boys' orchestra of the West Philadelphia High School.

In the evening, the reception and opening exercises were presided over by Chairman Joseph W. England, of the Board of Trustees, at which time brief messages by delegates of scientific societies and colleges were given by a number of those in attendance.

Secretary Kelly was compelled to leave before the evening exercises and therefore on his behalf and the AMERICAN PHARMACEUTICAL ASSOCIATION, Editor E. G. Eberle spoke briefly. Dr. R. L. Swain, representing the Maryland Board of Pharmacy, was also in attendance. Among others who responded and extended congratulations were the following: President Arthur C. Morgan of the Pennsylvania State Medical Society; the President of the Philadelphia County Medical Society; President Orlando, H. Petty of the Philadelphia Medical Club; former President Ambrose Hunsberger of the N. A. R. D.; Dean George H. Meeker of the Graduate Medical

School University of Pennsylvania; Professor E. Quinn Thornton of the Jefferson Medical College; Dean Frank C. Hammond of the Medical Department of Temple University; Dean Martha Tracy of the Women's Medical College, Pa.; Mrs. W. E. Lee of the Women's Auxiliary of the N. A. R. D.; Pres. Antonio G. Llamas, of Manila College of Pharmacy; Dean John Minehart, Temple University; Secretary J. G. Noh, Pennsylvania Pharmaceutical Association; President Bertha L. De. G. Peacock, of the Alumni Association; H. Swain of the Drug Veterans Club; President Raymond Hendrickson, Philadelphia Branch, A. PH. A.

TELEPHONE EXCHANGE SYSTEM IN SCHOOLS OF PHARMACY.

The School of Pharmacy of the State College of Washington has installed a telephone exchange system consisting of fifty telephones in the main manufacturing and pharmaceutical laboratory for the use of the student. Each desk is equipped with a telephone which is available for the student's use during all laboratory hours. One of the purposes of the exchange is to educate the students in the proper use of the telephone and to take prescriptions over the telephone. In extending this service the students are expected to criticize prescriptions and in a proper way call attention to errors. The same applies to the handling of other orders over the telephone.

ARIZONA INCREASES ITS MEMBERSHIP BY 150 PER CENT IN THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Through the active coöperation of Secretary H. C. Christensen (N. A. B. P.) and Prof. Arthur Lee Phelps of the Phoenix Junior College, Phoenix, the membership in Arizona has been increased 150 per cent. Professor Phelps expects to continue the good work and suggests that membership should be increased in the same proportion in other states.

LEGAL AND LEGISLATIVE.

HEALTH INSTITUTE PROPOSED IN NEW BILL BY RANSDELL.

A new bill for the enlargement of the United States Public Health Service has been introduced in the Senate by Senator Joseph E. Ransdell, of Louisiana, who previously introduced a bill which embodied all of the original provisions of the Parker Bill in the House.[1] The Ransdell Bill (S. 3391) authorizes the establishment of a national institute of health under the direction of the Surgeon-General of the Public Health Service, which shall be devoted to scientific research in the fundamental problems of the diseases of man and matters pertaining to health. An appropriation of $10,000,000 is authorized to establish laboratories in Washington, and it is provided that unusual apitude in science be required of employees. Gifts and donations would be accepted, and fellowships issued to scientists wishing to make special studies at the laboratories.

AMENDMENT TO STALKER BILL.

The Stalker Bill (H. R. 9588) provides—

"That wherever a penalty or penalties are prescribed by the National Prohibition Act, as amended and supplemented, for the illegal manufacture, sale, transportation, importation, or exportation of intoxicating liquor, as defined by Section 1, Title 2, of the National Prohibition Act, the penalty imposed for each such offense shall be a fine not to exceed $10,000 or imprisonment not to exceed 5 years, or both."

The drastic provisions of the Bill would make the owner of a business liable for the misdeeds or errors of his employees punishable by a severe fine and imprisonment.

Chairman Hersey, of the Sub-Committee of the House Judiciary Committee has introduced an amendment, which reads:

"No person shall be subject to the payment of taxes or penalties for the violation by a servant or agent of any law relating to liquor, denatured alcohol, or denatured rum unless such violation be committed with his actual knowledge or consent."

The bill should receive serious consideration by all who dispense medicinal alcoholics.

COSMETIC BILL OFFERED IN NEW YORK ASSEMBLY.

A bill amending the public health laws to provide for labeling cosmetics and prohibiting certain ingredients has been introduced in the New York State Assembly by Mr. Doyle as follows:

No cosmetic preparation to be used as a hair dye, hair tonic, dye remover, face bleach,

[1] Passed by the House March 7th.

face cream, face powder, rouge, mouth wash, toilet water, or depilatory, shall be sold, offered or exposed for sale, or given away, unless the package or container have affixed to it a label, in a form to be prescribed by the commissioner of public health stating: "The formula from which this preparation is made contains no lead mixtures, aniline derivatives, paraphenylenediamine, in excess of two per centum bichloride of mercury, ammoniated mercury, arsenic or caustic substances." Such label shall also state the name and address of the manufacturer or compounder and the year when the article was manufactured or compounded, together with the ingredients used therein, but need not state the quantities. Any person who shall sell or offer or expose for sale or give away any such cosmetic preparation which on chemical analysis is found to contain any of the prohibited ingredients in a quantity sufficient to be injurious to health or any person who shall sell, offer or expose for sale or give away any such cosmetic not so labeled, shall be guilty of a misdemeanor, punishable on conviction by a fine of not exceeding $500 or imprisonment in a county jail or penitentiary for not exceeding six months or by both such fine and imprisonment. The commissioner of health shall be in charge of the enforcement of the provisions of this article.

OREGON LAW RELATIVE TO NAME OF BUSINESS.

Under the Oregon law any person or persons who carry on business under an assumed name are required to register both their true name or names, and the assumed name under which they are doing business, with the County Clerk of the county in which the business is carried on. Many business men appear to be uninformed as to this; to comply with the law it is necessary that a certificate be executed and acknowledged by the one or more parties doing business under an assumed name. "Jones Drug Company," "Smith's Pharmacy" would be construed to be assumed names.

The law provides a fine of $100 for failure to register and also provides that no person or persons carrying on or transacting business shall be entitled to maintain any suit or action in any of the courts of this state without proving compliance with the aforesaid law.

Whenever there is a change in the ownership of a business, a certificate of withdrawal should be secured by the successor and a new registration filed.

SHARP & DOHME APPEALS BOOTS' RESORCINOLS DECISION.

Decision was reserved February 6th in the British Court of Appeal, London, on the appeal by Sharp & Dohme, Baltimore from the judgment of Justice Astbury in the Chancery Division in favor of Boots' Pure Drug Company, Nottingham, against whom the appellants brought the action claiming an injunction to restrain an alleged infringement by Boots of a patent owned by the appellants for "Improvements in or relating to the manufacture of alkyl resorcinols."

BOOK NOTICES AND REVIEWS.

Hager's Handbuch der Pharmazeutischen Praxis. Vollständig neu bearbeitet von Dr. G. Frerichs, Prof. Pharm. Chemie & Direktor des Pharm. Inst. Univ. Bonn., G. Arends, Medizinalrat & Apotheker in Chemnitz, & Dr. H. Zörnig, Prof. Pharmakognosie and Direktor der Pharm. Anstalt, Univ. Basel. Lex. 2 Volumes. I. Band, 282 Abbild. 1573 pp. MK. 63 = II Band. 426 Abbild. 1579 pp. MK. 63 = Verlag Julius Springer, Berlin, W 9, Linkstr. 23–24.

The name of Hager, Dr. Hans Hermann Julius Hager (1816–1897) is well known throughout pharmacy in all lands. In connection with the centenary of his birth the Editor of the JOURNAL A. PH. A. (Vol. V, January 1916 p. 3) expressed the following sentiment: "He was an honor to pharmacy and an inspiration to pharmacists; in his master work pharmacists have a guiding light and an illuminating book of reference." This refers to *Hager's Handbuch der Pharmazeutischen Praxis.* First published in two volumes in 1876 the demand became so intense that it had numerous reprints and was also supplemented by an Ergänzungsband in 1882. The next revised edition was begun by Hager and after his death in 1897 it was completed by B. Fischer and C. Hartwich and published in two volumes in 1900 with numerous reprints up to 1907. In 1908 a third volume by W. Lenz and G. Arends brought the excellent work up-to-date. In 1913

the live publishers instructed the above three authorities, one of which, Prof. Zörnig an honorary member of the A. PH. A., with the preparation of a new edition. Interrupted by the world war and consequently delayed, this up-to-date edition of Hager's Handbuch is now before us in two handsome lexicon volumes.

Hager's original intention was to produce a Handbook or better an Encyclopedia of Pharmacy which contains everything which the apothecary wishes to know pertaining to Vegetable, Animal or Mineral Drugs, Chemicals, Galenicals, Formulas, Specialties, Nostrums, in fact everything and anything scattered throughout the pharmaceutical literature. It is a compilation of all the Pharmacopœias and Formularies of all countries, including, needless to say, our U. S. P. and N. F. The old perplexing problem of an International Pharmacopœia is solved in Hager's Handbuch in an excellent manner.

The work begins with four pages of abbreviations used in the text. Then follows a very complete and excellent chapter on Methods of Analysis divided as follows: Physical Methods pp. 1–34; the Microscope and Its Use pp. 34–54; Chemical Methods, subdivided as follows: Tests of Identity and Purity pp. 54–57, Quantitative Analysis: Gravimetric pp. 57–59 and Volumetric pp. 59–80; Table of Constants pp. 80–83 and Atomic Weights p. 84.

The work itself is arranged in alphabetical order and preparations or derivatives are listed under the title of the drug or chemical. As an illustration we find under Acidum Aceticum pp. 95–111, besides the General Monograph the following varieties, derivatives, salts and preparations: Rectificatum, Acetum Aromaticum, Essig-Essenzen, Acetogen, Ammonium Aceticum, Liquor and Siccum, Acidum Aceticum Anhydricum, Acetylum Chloridum, Acidum Thioaceticum, Ammonium Thioaceticum, Acidum Monochloraceticum, Acidum Dichloraceticum, Acidum Trichloraceticum, Acetocaustin, Acidum Aminoaceticum, Betainum and Acidol. Notice is also given that Acidum Acetylosalicylicum is described under Acidum Salicylicum.

As an illustration of a vegetable drug we will cite Belladonna with the following sub-titles and monographs: Atropa Belladonna, Folia Belladonnæ with Emplastrum, Extractum, Extractum Siccum (Brit.), Extractum Liquidum (Brit.), Powdered Extract of Belladonna Leaves (Am.), Oleum Belladonnæ Infusum, Tinctura Belladonnæ, Tinct. B. ex Herba Recente, Tinct B. Aetherea, Ung. Belladonnæ, followed by 11 minor preparations from Belladonna Leaves. Then follows a monograph on Belladonna Root and its preparations and lastly a chapter on Belladonna Alkaloids and similar bases as: Atropinum, A. Sulfuricum, A. Valerianicum, A. Salicylicum, A. Methylobromatum, A. Methylonitricum, Hyoscyaminum, H. Sulfuricum, etc.; Homatropinum Hydrobromicum, Hydrochloricum, Sulfuricum, Salicylicum and Mydrin; Scopolaminum Hydrobromicum, Hydrochloricum, Hydroiodicum, Hyvalon, Atroscinum, Euscopol, Hyoscinum, Duboisinum and Sulfuricum, Hydrobromidum and Hydrochloricum. These two illustrations will prove the thoroughness of the text.

The main part of Hager ends with p. 997 in Vol. II. Then follows an Appendix up to p. 1392 containing numerous chapters among which we want to point out the following: Homeopathy, Veterinary Remedies, Cosmetics, Perfumery, Colors and Dyes, Inks, Photography, Distillation, Sublimatum, Sterilization, Dialysis and other processes, Analysis of Urine, Blood, Gastric Contents, etc., Innovations in the German Pharm. VI edition. A very complete Index pp. 1393–1579 in three columns gives an idea how thorough this excellent work has been compiled.

Hager's Pharmazeutische Praxis is a masterwork which should be in the hands of every pharmacist, who deserves this name. It was only a handful of friends who followed "Old Hager" to his grave and paid the funeral expenses; only an inexpensive monument has been placed in the cemetery in his honor; but more solid, more enduring, in fact everlasting, are his literary achievements and quite especially his "Pharmazeutische Praxis." Hager, "Altmeister der Pharmazie" and his masterwork "Pharmazeutische Praxis" long shall they live!

OTTO RAUBENHEIMER.

Plant Respiration. By S. KOSTYCHEV, translated and edited by Charles J. Lyon. Publishers, P. Blakiston's Son & Co., Philadelphia. 163 pages. Price $2.50.

Plant physiologists and biochemists alike will welcome this English translation of the German monograph already familiar to many. It is the aim of the author to portray the modern outstanding features of the science of plant respiration and to consider carefully the whole biochemical side of the problem from a uniform

standpoint. The author places considerable emphasis on his theory of connection between oxygen and anaerobic respiration, and although a great deal of work still remains to be done in this chemical field, he has placed it in a central position. On either side of this he carefully reviews and classifies all of the scientific knowledge of these two phases of respiration. The chemical explanations are excellent and the references to the literature comprehensive and complete. The monograph is divided into five chapters:

I. Oxygen Respiration.

II. Anaerobic Respiration.

III. The Connection of Oxygen Respiration with Anaerobic Respiration.

IV. The Chemical Processes in Plant Respiration.

V. Respiration at the Expense of Mineral Substances.

The translator has admirably captured the finer distinctions of the German text without the awkwardness more or less common in translations where such close adherence to the text becomes a necessity. The volume is also well edited and the literature published in the interum between the German edition and the translation has been properly recorded and reviewed, even to Stoklasa's work during 1926. He has also included newer analytical methods not in the German text. Among these are Osterhout's method for measurement of the rate of CO_2 production, Waller's modification of the Katharometer, etc.

E. H. W.

Trade Association Activities.—The foreword of this recent publication reads: "In 1923 the Department of Commerce issued a volume on Trade Association Activities. The present publication is intended to bring this work up-to-date.

"The purpose of this and of the previous publication is to indicate the successful service of trade associations in public interest. In the field of scientific and economic research, in statistics, in simplification and standardization of commodities, in the promotion of arbitration in commercial disputes, in development of foreign trade and in scores of other directions trade associations have made a most valued contribution to our economic progress.

"While our industry and commerce must be based upon incentive to the individual, yet the national interest requires a certain degree of coöperation between individuals in order that we may reduce and eliminate industrial waste, lay the foundation for constant decrease in production and distribution costs, and thereby obtain the fundamental increase in wages and standards of living.

"Trade associations, like many other good things, may be abused, but the investigation of the Department of Commerce shows that such abuses have become rare exceptions. Within the last few years trade associations have rapidly developed into legitimate and constructive fields of the utmost public interest and have marked a fundamental step in the gradual evolution of our whole economic life."

Commerce Year Book, 1926, Volume 1—United States.—Compiled by the Bureau of Foreign and Domestic Commerce. Julius Klein, Director. This volume which has to do with domestic commerce has recently been issued. It is comprehensive and a source of a great deal of information required by all the industries. It may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. for $1.00.

PUBLICATIONS RECEIVED.

We are indebted to The Wellcome Chemical Research Laboratories, The Wellcome Foundation Ltd., T. A. Hency D.Sc., Director, Snow Hill, London, for reprints of some of their investigations made during the past two years. Titles and names of authors follow:

"The Determination of Ascaridole in Chenopodium Oil," by H. Paget.

"Mercuration of Some Alkylphenols and Alkylphenolaldehydes," by T. A. Henry and T. M. Sharp.

"The Action of Antimony Trichloride upon Diazotized Diamines," by W. H. Gray.

"Separation of *d*-neo Bornylamine from *d*-Bornylamine," by J. A. Goodson.

"The Alkaloids of Picralima Klaineana," by T. A. Henry and T. M. Sharp.

The Plaster Book—Issued by Johnson & Johnson.—This book is in essence a textbook on plasters, giving information in regard to medicated and unmedicated plasters not ordinarily found in the textbooks. The book gives the composition and medication of plasters, briefly outlines their uses, as well as giving information in regard to their storage, care and dispensing. The second part of the book takes up sales suggestions. The book may be obtained by druggists without cost by addressing the publishers.